

# SILICA GEL ACTIVATED CARBON

(INDICATING AND NON-INDICATING TYPE)  
(POWDER/GRANULAR; CHEMICALLY ACTIVATED)

**ORTHO DICHLORO BENZENE  
PARA DICHLORO BENZENE  
ORTHO PHENYLENE DIAMINE  
BENZYL CHLORIDE/BENZOATE  
MONO CHLORO BENZENE  
TRI CHLORO BENZENE**

**Ortho Nitro Aniline  
Meta Chloro Aniline  
Para Chloro Aniline  
Butyl Stearate  
Octyl Stearate  
Octyl Acetate**

**Methyl oleate  
Cocoanut Di Mono  
Ethanolamine  
Magnesium Chloride  
Crystals  
Paraformaldehyde**

**ISO PROPYL MYRISTATE  
ISO PROPYL PALMITATE  
EDTA DISODIUM SALTS  
PEG 200, 400, 600**

## **DRIER CHEMICALS**



100, Dada Saheb Phalke Road,  
Dadar (East),  
BOMBAY - 400 014 (INDIA).

Tel.: 448051-448661

Resi.: 4221658



# IMPORTED RAW MATERIALS AVAILABLE WITH MODVAT & DUTY DRAW BACK BENEFITS From Ready Stock/Incoming Consignments on High Seas Basis

## PHARMACEUTICAL, COSMETIC & FOOD INDUSTRY

- \* PROPYLENE GLYCOL USP (DOW)
- \* AEROSIL -- 200
- \* PVP k-25, 30, 90 USP (Polyvinyl Pyrrolidone)
- \* TWEEN 80 USP
- \* ETHYL CELLULOSE NF/USP  
Grades: N-7/10, 20/22, 45/50, 100, 200
- \* HPMC (Hydroxy Propyl Methyl Cellulose)  
E-5, 15, 50, K-100, K-4M  
(Pharmacoat 606, 615, 650)
- \* MODIFIED CELLULOSE GUM (AC-DI-SOL)
- \* MICRO CRYSTALLINE CELLULOSE USP  
Grades: AVICEL PH-101, PH-102, RC-581
- \* HYDROXY ETHYL CELLULOSE  
(Natrosol 250 LR/GR/MR)
- \* CARBOPOL 934, 940
- \* SODIUM SACCHARIN IP/BP
- \* TITANIUM DIOXIDE (Pharma Grade)  
Rutile - RKB2 (Bayer)  
Anatase-3328 (Whittakar)
- \* GUM ACACIA IP (SUPERWHITE)
- \* PETROLEUM ETHER 40°-60°
- \* RESORCINOL (Japan)
- \* LACTIC ACID U.S.P.
- \* PARA CHLORO META CRESOL (PCMC)
- \* SOYA LECITHIN (Brazil)
- \* BHA/TBHQ
- \* VANILLIN/ETHYL VANILLIN
- \* DL-METHIONINE HYDROXY ANALOG  
(MHA 86%)

## PERFUMERY & FLAVOUR INDUSTRY

- \* VANILLIN/ETHYL VANILLIN
- \* DI PHENYL OXIDE (USA)
- \* PROPYLENE GLYCOL (DOW)
- \* DI PROPYLENE GLYCOL (DOW)
- \* COUMARIN
- \* SANDELLA (IBCH)
- \* TWEEN 80 USP

## MISCELLANEOUS

- \* TETRAHYDROFURAN (THF)
- \* 1:4 DIOXAN
- \* MORPHOLINE
- \* PYRIDINE PURE 2°C
- \* HYDROXYLAMINE HYDROCHLORIDE
- \* PETROLEUM ETHER 40°-60°
- \* N-METHYL PYRROLIDONE
- \* PROPARGYL ALCOHOL, 1:4 BUTYNEDIOL
- \* ETHYL CELLULOSE (ALL GRADES)
- \* N-PROPANOL
- \* MONO ISOPROPYLAMINE
- \* AMMONIUM PERSULPHATE
- \* POTASSIUM PERSULPHATE
- \* SODIUM BORO HYDRIDE
- \* SODIUM METHOXIDE
- \* ADIPIC ACID
- \* BISPHENOL-A
- \* ISOPHTHALIC ACID
- \* BUTYL TITANATE
- \* MODAFLOW RESIN MODIFIER

Please contact us for your specific requirements:

**MUKESH H. KAMDAR / HARISH SHAH**



# CROWN CHEMICAL PRODUCTS UNIMARK CHEMICALS



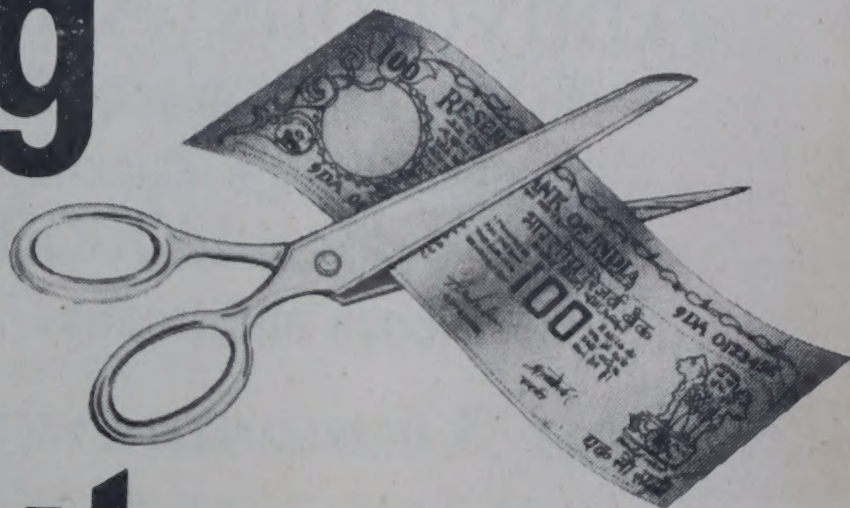
208-209, Adamji Bldg., Narsi Natha Street, Musjid Bunder, Bombay-400 009

Telephone: 334290, 345910, 483892, 541412

Telex: 011-75197, 011-76664



# Cutting Cost Without Cutting People



FINE ORGANICS offer 100% concentrates for making your own Textile auxiliaries like SOFTNERS (Nonionic, Cationic, Reactive or Anionic), MERCERISING & WETTING AGENTS, PE & WAX EMULSIONS, SCOURING & WASHING AGENTS, SYNTHETIC PRINTING THICKENERS FOR Pigment, Reactive or Disperse/Acid Colour Printing, Replacements of Kerosene or Sodium Alginate, etc .

By using 100% Concentrates of FINE ORGANICS, you can bring down your auxiliary cost to half. Meet us for practical demonstration.

For further details, please write to:



**FINE ORGANICS**

15/2 NEELKANTH MARKET, M.G. ROAD,  
GHATKOPAR (E), BOMBAY-400 077.  
PHONES: 5135356, 5135471, 5135687



Please Contact for Prompt Supplies Of:

# Anhydrous Ammonia Gas

In 5/7/9 Tons Capacity Road Tankers and

In 60/50/40 Kgs. Capacity Cylinders.

Also Available **LIQUOR AMMONIA**

In Carboys and Drums

## Surat Ammonia Supply Company

B.N. Chambers, 2nd Floor, R.C. Dutt Road, Baroda 390 005.

Phones: 326503, 323827, 321897 & 320676 \* Gram: SASCO \* Telex: 0175-497 SASCO-IN

Vapi Office: Shed No. 19, C-1, B. Type, Vapi Industrial Estate, G.I.D.C., Vapi-396 195. Phone: 685.

Ankleshwar Office: J-3435, G.I.D.C. Estate, Ankleshwar-393 002, Gujarat State. Phone: 2449.

## BOMBAY AMMONIA & CHEMICAL CO.,

204, Wing-B, Neelam Centre, 2nd Floor, Hind Cycle Road, Behind Glaxo, Worli, Bombay 400 025.

Phones: 4948652/4948659/4946686



**ATTENTION!**  
Actual Users/Dealers/Stockists Reduce Your Cost By Using Our Products

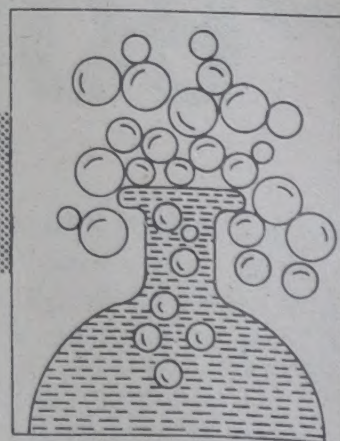


**PREMOULD-600**  
SILICONE MOULD RELEASE AGENT  
FOR RUBBER INDUSTRIES.



**PRESIL-300**  
SILICONE EMULSION FOR  
TEXTILE INDUSTRIES.

**& AMINO SILICONES**



**MULTI  
FOAMER N.P.J.**  
SILICONE DEFOAMER/  
ANTI FOAM EMULSION

Please Contact:

## PREMIER CHEMICAL INDUSTRIES

Shah & Nahar Industrial Estate, A-1, Gala No. 109, 1st Floor. Near Sun Mill Compound, Lower Parel (W), Bombay - 400 013.  
PHONE : 4949771 — 4942176 — 4945869

Branch: 538, Jash Market, Ring Rd., SURAT-395 002. PHONE: 40136



NOW AVAILABLE:

**96% A.D. DODECYL BENZENE SULPHONATE**  
(HARD ACID SLURRY)**LINEAR ALKYL BENZENE SULPHONATE**  
(SOFT ACID SLURRY)**SULPHONATED WITH SULPHUR TRI-OXIDE**

MANUFACTURERS:

***Arochem Silvassa Pvt. Ltd.,***Industrial Estate, Silvassa-396 230 -- Via Vapi,  
Dadra & Nagar Haveli.

Phone: 289, 291      Gram: AROCHEM SILVASSA

Telex: 0185 201 ARCM IN

- BOMBAY** : Scent House, Station Road, Goregaon (West), Bombay-400 062.  
Phone: 6722280, Gram: AROSILVASSA, Telex: 011-78077 FAIS IN
- KANPUR** : Chemdet Enterprises, Shop 67, 75/232, Sabji Mandi, Kanpur.  
Gram: SCENTOUS, Telephone: 64551
- MADRAS** : Syndet Enterprises, 90, Govindappa Naick Street, Madras-600 001.  
Gram: SCENTOUS, Telephone: 35532
- DELHI** : B. Shantilal & Co., 1025/5, First Floor, Gali Teliyan, Tilak Bazar, Delhi-110 006.  
Gram: INDOSIL, Telephone: 291 3973/0649

AVAILABLE REGULARLY

***SPRAY DRIED 40%***  
***A.D. ANIONIC DETERGENT***  
***POWDER NEUTRAL-pH: 7-7.5*****In Snow White Colour & Free Flowing**  
**Bulk Density below 0.3**

Manufacturers

***Silvassa Syndet Private Limited***Amli Industrial Estate,  
SILVASSA - 396 230 -- Via Vapi,  
Dadra & Nagar Haveli  
(Phone: 280)



AVAILABLE REGULARLY EX-STOCK:

**Folic Acid I.P.**

\*

**Metronidazole I.P.**

\*

**Sulphaguanidine I.P.**

\*

**Pyridoxine Hydrochloride I.P.****Cephalexin I.P.****Theophylline****Caffeine I.P.**

CHLOROQUINE PHOSPHATE I.P.

SULPHADIMIDINE I.P.

MICONIZOLE NITRATE I.P.

SULPHAMETHOXAZOLE I.P.

AMPICILLIN TRIHYDRATE I.P.

AMOXYCILLIN TRIHYDRATE I.P.

DIAZEPAM I.P.

PYRAZINAMIDE B.P.

FURAZOLIDONE I.P.

ANALGIN I.P.

ISONIAZID I.P.

IBUPROFEN B.P.

PARACETAMOL I.P.

TRIMETHOPRIM I.P.

CHLORAMPHENICOL I.P.

CLOXACILLIN

Authorised Selling Agent of:

M/s. Samyuk Resins &amp; Chemicals P. Ltd. \* M/s. Tini Pharma P. Ltd.

M/s. Pareek Chemicals \* M/s. Armour Chemicals P. Ltd.

Please Contact:

**M/s. R. RATILAL & CO.**

(CHEMICAL DIVISION)

111, Mahatma Gandhi Road, Fort, Bombay 400 023.

Phones: 274119/271776; Resl: 6363306

\* Telex: 011-2594

\* Cable: "PLENTY"

Available Regularly Ex-Stock/Ex-Factory

SODIUM HYDROXIDE PELLETS Pharma (BP/IP Specification Passes)

LR/AR/GR Grades

POTASSIUM HYDROXIDE PELLETS Pharma/LR/AR Grades

GUANIDINE NITRATE Extra Pure Grade 98-99%

SUCCINIC ACID Extra Pure 99%

SUCCINIC ACID AR/LR

SODIUM SUCCINATE EP

CALCIUM SUCCINATE EP

SUCCINIC ANHYDRIDE EP

**Manufactured by: "CALIRON" Group of Industries**

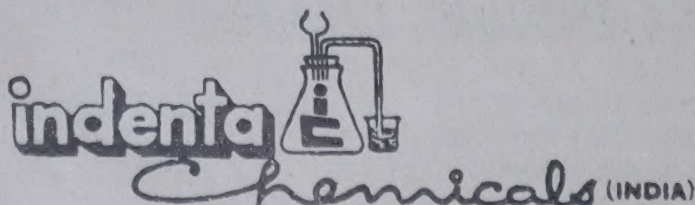
M/s. CALIRON CHEMICALS

M/s. CALIRON ORGANICS

M/s. CALIRON SYNTH-CHEM (P) LTD.

P.O. Box No. 184, LUDHIANA - 141 008.

PLEASE CONTACT SELLING AGENT/BOOKING AGENT/AUTHORISED STOCKIST:



**indenta** Chemicals (INDIA)

PRIVATE LIMITED

201, Adamji Building, 2nd Floor,  
Syed Mukri Street, Katha Bazar,  
Bombay 400 009.

Cable: INDUMADI, BOMBAY-9.

Tel.: 343875/349820/330324.

Telex: 011-73098 INDU IN.

Tele Fax: FAX: (91)-22 4941163.

Attn: M/s. Indenta -- Menon.



Winners of "RCF AWARD FOR HIGHEST SALES" in Methanol for 1986-87

**Your Guarantee for  
Genuinity**

**BUY ONLY R.C.F.'S**

**METHANOL** ( $\text{CH}_3\text{OH}$ )

**FROM NUKEM**

**THE AUTHORISED DEALERS OF R.C.F**

WE OFFER UNIQUE DOOR-TO-DOOR  
DELIVERY ANYWHERE IN THE COUNTRY.  
EVEN AS LITTLE AS 2000 LITRES  
IN OUR OWN FLEET OF TANKERS  
A UNIQUE SERVICE TO OUR  
VALUED CUSTOMERS

ESTD 1964



**Nukem Corporation**

P.O. BOX 16478 BOMBAY-400 016.  
PHONES: 456647 • 453096 • 451951  
GRAM: BROMINKING TELEX: 71009.

**METHANOL**

**IS OUR BUSINESS SINCE TWO DECADES**



## OCTADEX EM

Excellent Softener for Shirtings, Suitings and Dress Materials.  
Almost 90% Textile Processing Houses in Bombay are using OCTADEX EM

## STAINSOL VC

Stain Remover Against IMPOL XI of SANDOZ for Hand Spotting Jigger.  
Jet Dyeing and Beam-Dyeing use.

## VIKKAWHITE - PR

Fluorescent Whitening Agent for Polyester (Develops at low temperature)

## WHITE PASTE FOR KHADI PRINTING

On Cotton and Polyester/Cotton (Excellent fastness and withstands  
carbonising and alkaline wash with hydro and Caustic)

NO CURING REQUIRED

Contact: Manufacturers & Exporters:

## VISEN CHEMICALS PVT. LTD.

222/A, Virwani Industrial Estate, Western Express Highway, Goregaon (East),  
BOMBAY 400 063. Tel. No. Office: 6885797; Resi: 6722385

Factory: Plot No. K-30, MIDC, Tarapur, Maharashtra.



## HOUSE OF CHEMICALS

### HERDILLIA BOMBAY

Truckloads/Drums  
Small Packings.

### ACETONE DIACETONE PHENOL

Caustic Pellets  
Perchloric Acid  
Mercury Salts  
Cobalt/Cadmium/Nickel  
Salts. Lithium Salts &  
Electronic Grade Chemicals

### SHRISHMA BANGALORE

**SALICYLIC ACID**  
Tech. 95%/99%

### ASPIRIN & OTHER SALICYLATES

### METAL POWDERS:

Tin, Zinc, Aluminium

&

### NICKEL SCRAP

### INDUSTRIAL SILICA WARES (LOT)

Retorts One neck O.D. 9"  
(ID 7") H 23"  
Diameter 18".. 3 Nos.

Retorts with raised neck  
having one hole  
2-1/2, H-30", D-18" .. 3 Nos.

Trays (L-24", W-12-1/2",  
depth 9") .. 2 Nos.

Beakers (5 gal), crucibles  
(H-31", O.D. 8")

Coil Condensers, Pipes, etc.  
available

Inspection on request.

Please Contact:

## NATIONAL SOLVENTS CORPORATION

B. No. 9, Devkaran Mansion,  
Pathakwadi, S.G. Marg,  
Bombay 400 002.

Tel: 259733/292218; Tlx: 011-4149 DRUG



HISTORY

IN SIZING TECHNOLOGY...



(A KHATAU ENTERPRISE)

introduces Revolutionary Sizing  
Technology in India from  
**SEYDEL-U.S.A.**

(World Masters in Sizing)

After successfully introducing

**SEYCOFILM PE-230**

(Synthetic Resin-Substitute for PVA and acrylics, which  
will assure at least 10-25% reduction in sizing cost)

Now offers

**SICO-12**

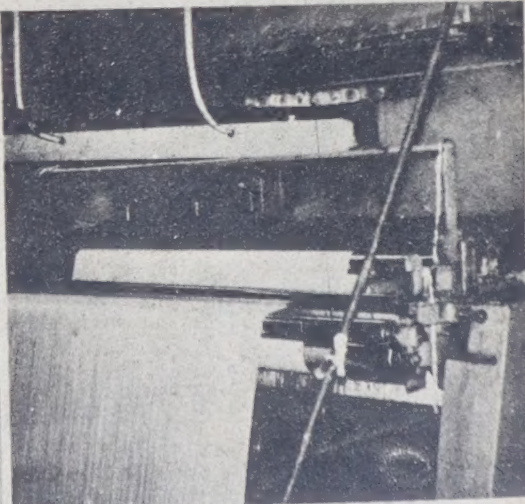
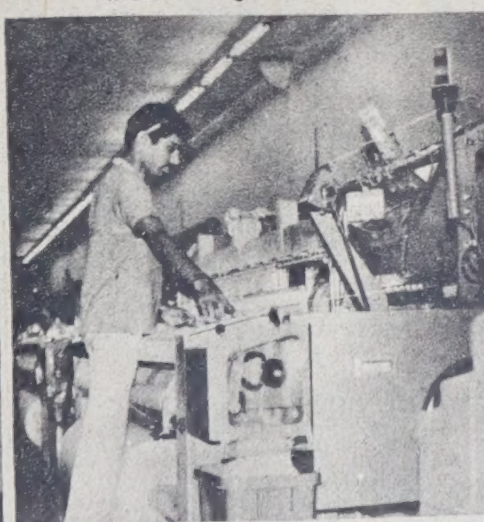
(Substitute for Mutton Tallow)

Also introducing shortly

**FILAMENT  
SIZING  
CHEMICALS**

(Suitable for WATER JET  
and AIR JET LOOMS)

Modern High-Speed Weaving means High Quality Sized Beams.



The objective can be achieved only by Sophisticated Items from SICO RANGE

**SICO-RANGE**

The Name  
that spells  
Quality  
& Economy



For further details, please contact  
**INDOKEM LIMITED**

Udyog Mandir Compound,  
77C, Bhagoji Keer Marg,  
Mahim (W), Bombay-400 016

Phone 462721 • 462728 • 462842 • 457765 • 456299 • 452029 Telex 011-71348 Gram INDOKEM



DIRECT IMPORTERS & STOCKISTS OF:  
**POLY VINYL ALCOHOL**

HOT GRADE -- POLYSIZER 173/BF--17

COLD GRADE -- GOHSENOL GH--17/BP--20/BP--17/BP--24/GL--05/BP--05

**Acrylamide--Japan**  
**Acrylic Acid--Japan**  
**Hydroxy Ethyl Cellulose**  
**Natrosol<sub>250</sub> LR/GR/HBR Hercules Make**  
**2 Ethyl Hexyl Acrylate**  
**Butyl Acrylate**  
**P.T.B.P.**

**Titanium Dioxide**  
**Hydrogen Peroxide 50%**  
**Emulsifier Polyethylene**  
**Wax**  
**Poly Vinyl Acetate**  
**Emulsion**  
**M.E.K.**

Please Contact:



## HEAVY CHEMICALS CORPORATION

18/20, V.V. Chandan Street, Kachwala Building, 2nd Floor, Off Masjid Bunder Road,  
 Bombay - 400 003.  
 Phones: 327973/348148

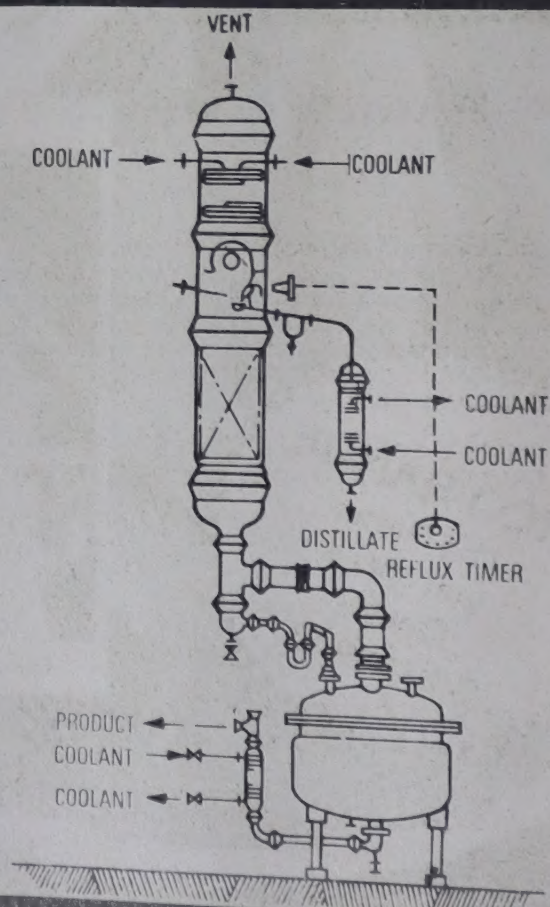
**9" AND 12"**  
**Indigenously**  
**Manufactured**  
**Borosilicate**  
**Glass Components**  
**At incredibly**  
**economical rates**

Mfrs:

**GOEL SCIENTIFIC WORKS**

D-35, Sardar Industrial Estate, Ajwa Road,  
 Baroda - 390 019. Ph: Off. 541692, Resi. 541628

TRADE ENQUIRIES SOLICITED







## **The Planet Earth is the greatest chemist we know.**

What fecund and creative chemistry.

Every human, plant, animal, rock, gas or liquid on earth has a simple or complex chemistry behind it. The idea of so much thought and unconscious formulation seems mind-boggling, but Nature does it regularly and effortlessly. It inspires us.

Process chemicals for the textile industry for Sizing, Desizing, Mercerising, Scouring, Dyeing, Printing and Finishing.

**SUPERTEX**™

**SUPERTEX**®

(INDIA) CORPORATION

132, Dr. Annie Besant Road, Bombay-400 018

Phone: 493 6041, 493 38 18, 493 5482.

Grams: 'Thinogum'. Telex: 75643.

a M.C. Saraf Enterprise  
Most trusted name in chemicals.



For Your Requirements Of:  
PURE, EXTRA PURE & I.P. QUALITY CHEMICALS  
IN BULK QUANTITIES



SYMBOL  
OF  
QUALITY

*Sodium Acetate Crystals*  
*Sodium Acetate Anhydrous*  
*Calcium Acetate*

AVAILABLE AT VERY COMPETITIVE RATES

Please Contact:

**SYNTHETIC HYDROCARBONS**

115, A-Z Industrial Estate, Ganpatrao Kadam Marg,  
Lower Parel, Bombay - 400 013.

Phones, Office: 492 37 60 / 492 82 21

Resi: 640 49 65

Factories at BOMBAY & TALOJA

For Guaranteed -- Safer Reliable Supplies of  
**CARBON DISULPHIDE \* CARBON TETRA**

in Tankers & Drums

as also Acetone/DAA/DEP/Amines/Alcohols etc. in packings  
of your choices

We require in Bulk Quantities

**ISOPROPYL ALCOHOL (Deodorised)**

**METHYL ACETATE CP \* ISOPROPYL ACETATE**

Please Quote With Samples.

**Laxmi Chemical Industries**

32, S. Gandhi Marg (Princess Street), Shroff Mansion, Bombay - 400 002  
Phone: 317494 (3 to 6)

Resi: 649 2637

Gram: 'CHEMICARE'

**SHROFFS TECHNICAL SERVICES PVT. LTD.**

**Offer**

PHOSPHORIC ACID IP, TECHNICAL, AR & POLY

PHOSPHOROUS PENTOXIDE

PHOSPHOROUS ACID CRYSTALS & SOLUTIONS

PHOSPHOROUS TRICHLORIDE

PHOSPHOROUS OXYCHLORIDE

BROMHEXINE HCl — BP

ATENOLOL

PARA-HYDROXY PHENYL ACETAMIDE (PHPA)

Regd. Office :

Excel Estate, S. V. Road, Goregaon (West), Bombay-400 062:

Tel : 6723865, 6723866, 6723021, 6720324, 6722709, 6725117, 6725119

Tlx : 11-78223 STS IN

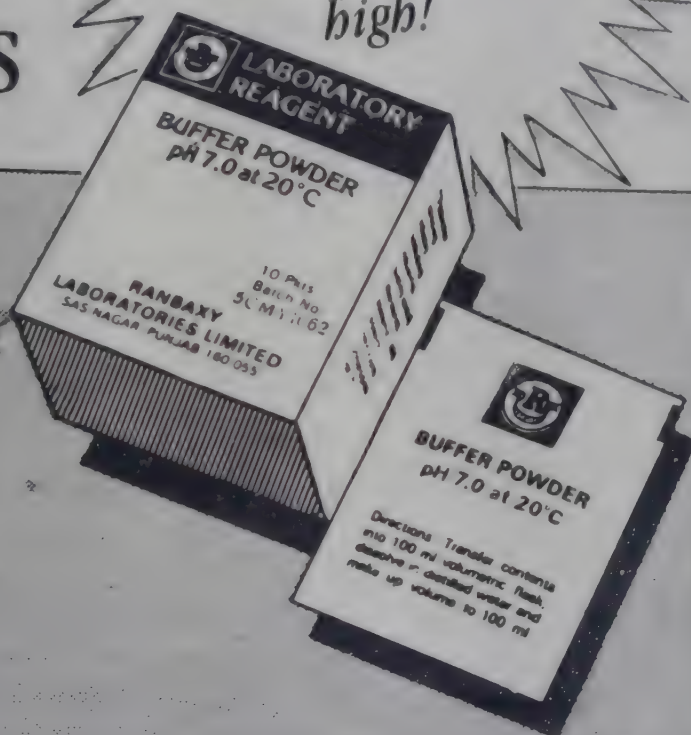


Now,  
for the first time in India

# RANBAXY introduces Buffer Powders

the innovation  
over tablets  
the world is  
switching to!

*In unique,  
moisture-proof  
sachets – that keep  
the powder dry &  
the accuracy  
high!*



Ranbaxy now offers for the first time in India buffer salts in powder form. Buffer powders have gained widespread acceptance in the developed countries and are gradually replacing the use of buffer tablets. Moisture-proof sachets keep the material dry and free flowing leading to greater accuracy. Ranbaxy's buffer powders are available for pH 4.0, 7.0 and 9.2.

## Count your advantages

1. Tablets take a long time to go into solution whereas Ranbaxy's Buffer Powders dissolve instantly.

2. The glassine-poly sachets keep the powder completely free from moisture.
3. Ranbaxy's Buffer Powders, a superior product by all standards; are very competitively priced.

*For your requirements, please contact:*



**RANBAXY**  
LABORATORIES LIMITED

CHEMICAL DIVISION MARKETING OFFICE  
16, MARINA ARCADE, CONNAUGHT CIRCUS  
NEW DELHI - 110 001  
Phones : 323738, 323739; Telex : 031 4220  
Cable : RANBAXYLAB CONNAUGHT CIRCUS

Put **RANBAXY** Reliability in your Laboratory !



AVAILABLE FROM READY STOCK AT COMPETITIVE RATES

Aniline Oil  
Butyl Acetate  
Carbitol \* Cellosolve  
Di Octyl Phthalate  
Ethyl Acetate  
Iso Propyl Alcohol  
N-Propanol \* Acetone  
Chloroform  
Cresol (Technical)  
Dimethylamine  
Di Butyl Phthalate

Ether Solvent  
Iso Propylamine  
N-Heptane \* Sorbitol  
Butanol-N/Iso  
Carbon Tetra Chloride  
Carbon Di-Sulphide  
Diethnaolamine  
Diethylene Glycol  
Ethylene Di Chloride  
Nitrobenzene  
Oleic Acid Pure/Tech

Methanol \* Pyridine  
Methylene Dichloride  
Perchloro Ethylene  
Pine Oil Commercial  
1-1-1 Trichloro Ethane  
Toluene  
Triethylamine  
Soyalecithin  
Monoethanolamine  
Thionyl Chloride  
Trichloro Ethane

Please Contact:

## M/S. MAKS CHEM INDUSTRIES

89, Princess Street, 2nd Floor, Pirbhoy Mansion, Bombay-400 002

Phones: Off: 312358/257898/254363; Resi: Mr. K.L. Shah -- 6885928/690131; Mr. M.L. Shah -- 6126969; Gram: MAK SOL

WE BUY CHEMICAL WASTE & DISTILLED SOLVENTS REGULARLY

For Your Requirements Of:

\* **ALPHA BLUE**  
\* **RUBINE TONER**  
\* **LAKE RED C**  
*and other pigments*

Please Contact:

## M/s. DIPEE CHEMICALS PVT. LTD.

102, Sarvodaya Commercial Centre, Salapas Road, Ahmedabad-1.

Telephone No. 23940.

Manufacturers:

M/s. Sapphire Colours  
ANKLESHWAR

M/s. Swastik Colour-Chem  
ANKLESHWAR

## ATTENTION

EXPORTERS/INDENTORS/ACTUAL USERS

For Your Requirements of

**ORTHO ANISIDINE**  
**PARA ANISIDINE**

Please Contact Manufacturers

## NANDOSAL CHEM INDUSTRIES PVT. LTD.

Factory: 49, G.I.D.C., Vapi - 396 195.

Tel. No. 1274

Office: 7, Dharam Jyot, 96, Kazi Sayed Street, Bombay 400 003.

Tel. No. 339535



# For your imports of

Caustic Soda Flakes	Chlorosilanes	Silane BSU
2-Ethyl Hexanoic Acid	Fumed Silica	Glyoxal
2-Ethyl Hexanol	Lactose	Dicyandiamide
Acetic Anhydride	Neopentylglycol	Sodium Chlorite
n-Butanol	Acetyl Chloride	Hydroxy Ethyl
Pentaerythritol	Thiourea	Cellulose
Laboratory Chemicals (Riedel-de-Haen)		P-Hydroxy Phenyl Acetamide

and other products of  
**HOECHST AG**  
and associated companies  
please contact:

## **HOECHST INDIA LIMITED** **INDUSTRIAL DIVISION**

Hoechst House, Nariman Point, Bombay-400 021 Tel: 230607 Telex: 2747 HEXT IN 5299 HEXT IN

or Branches at:

- Ahmedabad - Mission Road, Bhadra, Ahmedabad-380 001. Tel: 397131 / 397522
- Calcutta - 6, Ganesh Chandra Avenue, Calcutta-700 013. Tel: 275404 / 5 / 6
- Delhi - Hoechst House, Asaf Ali Road, New Delhi-110 002. Tel: 265451 / 273804
- Madras - McDowell House, 3 Second Line Beach, Madras-600 001. Tel: 20167 / 20866

**Products offered:** Inorganic Chemicals, Organic Chemicals, Intermediates, Dyes/Pigments, Synthetic Fibres, Synthetic Resins, Silanes/Silicones, Polyester Film, Decal Paper, Diazo Base Paper, High Purity Chemicals, Products for the Electronic Industry and many other speciality chemicals.

# Hoechst





a reliable source of supply for

## REACTIVE DYES

### A. High Exhaust (HE) Series

1. CCI Re. Yellow HE4G
2. CCI Re. Golden Yellow HER
3. CCI Re. Orange HE2R
4. CCI Re. Red HE5B
5. CCI Re. Red HE7B
6. CCI Re. Red HE8B
7. CCI Re. Brown HER
8. CCI Re. Brown HE4R
9. Keyactive Navy Blue HER
10. Keyactive Navy Blue HE2R
11. Keyactive Navy Blue HE5R
12. Keyactive Jade Green HE4G
13. Keyactive Green HE4BD
14. Keyactive Dark Green HE7B
15. Keyactive Black HEBL

### B. Cyanuric Based Series

1. CCI Re. Yellow MGR
2. CCI Re. Red M8B
3. Keyactive Brilliant Blue MR
4. Keyactive Brilliant Blue H5R
5. Keyactive Navy Blue HR

### C. Vinyl Sulfone Based Series

1. CCI V. S. Yellow FG
2. CCI V. S. Orange 3R
3. CCI V. S. Red C2G
4. CCI V. S. Brown GR
5. Keysulfone Violet 5R
6. Keysulfone Black BG

Please Contact the Manufacturers :

**Colour & Chemical  
Industries  
Kusum Enterprises**

Sales Office :

44, Gaya Building, 4th Floor,  
109, Yusuf Meharali Road,  
Bombay-400 003.

Phone : Off.: 345581

Res.: 6720195

Gram : HONEYSUN. Bombay-90

Works:

Plot No. J-719/2,

40, Shed Area, GIDC,

VAPI, (Gujarat).

Tel.: 1446

For Your Requirements Of :

# **Benzyl Chloride Benzoyl Chloride Benzo Tri Chloride Benzaldehyde**

Contact Manufacturers :

**SHUBHAM AROMATICS LIMITED**

Factory:

Birlagram,

NAGDA (MP) 466 331.

Phone : 283,104

Regd. Office:

29, Bank Street, 1st Floor,  
BOMBAY-400 023.

Phone: 2862453/2863021

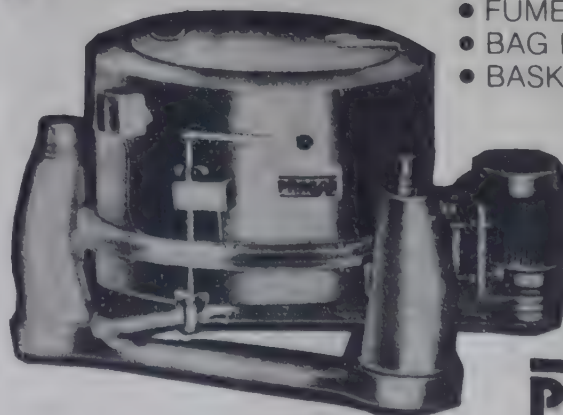
Gram: "METALDIST"

Telex : 011-6554 MINA IN

TRIAL FACILITIES  
OFFERED

## **CENTRIFUGES HYDRO-EXTRACTORS**

- BOTTOM DISCHARGED TYPE
- FUME TIGHT
- BAG LIFTING TYPE
- BASKET LIFTING TYPE



### **SPECIAL FEATURES**

- Three Pendulum Suspension
- DYNAMICALLY BALANCED BASKET
- Smooth running
- Compact design for minimum floor space
- More efficient washing

**PRAGATI**

Manufactured by:

**PRAGATI ENGINEERING WORKS**

Plot No. N-8, Shed No W-88,  
CHIKALOLI, M.I.D.C.,  
AMBARNATH-421 501

Phone: Dombivli: 929-86-5410

TOPNAGS





*Connected to one of the oldest industries in the world, which incidentally is also the youngest.*

*From ancient garments made of bark and hide, through historical finds of Chinese silk and Egyptian cotton at burial sites, to modern fabrics made on computerized looms, humankind's relations with clothes are as old as civilization. From the time when lamp-black, powdered lapis lazuli, red ochre, dye secretions of the banded murex snail, indigo and other plant, mineral and animal dyes have been used, human fascination with colouring agents is also well known.*

*We at Texchem continue this odyssey, this quest for cloth and its colour.*

*Process chemicals for the textile industry for Sizing, Desizing, Scouring, Mercerising, Dyeing, Printing and Finishing.*

**TEXCHEM<sup>®</sup>**

**TEXCHEM<sup>®</sup>**

132, Dr. Annie Besant Road, Bombay-400 018

Phone: 298 6011, 298 8818, 298 5182.

Grams: 'Thinqqum'. Telex: 756713.

*a M.G. Sargol Enterprise*

*Most trusted name in chemicals.*



For Your Requirements Of:

AMMONIUM MOLYBDATE (99.9% PURE)

SODIUM MOLYBDATE (Assay 99%)

CADMIUM

-- CHLORIDE/ SULPHATE/CARBONATE/OXIDE/NITRATE

BISMUTH

-- NITRATE/OXIDE/CITRATE/SUBCARBONATE/OXYCHLORIDE/SUBNITRATE

COBALT

-- NITRATE/CARBONATE/ACETATE/CHLORIDE/SULPHATE/OXIDE/OXIDE BLACK

NICKEL

-- CARBONATE/NITRATE/OXIDE/SULPHATE

POTASSIUM

-- IODIDE/IODATE

EDTA DI SODIUM SALT

Contact Manufacturers

## MONARCH CHEMICAL INDUSTRIES

Admn. Office: 25, Old Sattagali (Kaviniray Gali), Tarachand Ghanshyamdas Bldg.  
1st Floor, Sheikh Memon Street, Bombay - 400 002

Phones: Office: 318998/319814

Resl: 8129380/8127641



Manganese Sulphate  
Manganese Acetate  
Manganese Carbonate

Magnesium Sulphate  
Sodium Sulphate  
Magnesium Sulphate  
Anhydrous Magnesium  
Minimum 17%

For Your Requirements, Contact:

*Lakshman Chemicals (Davangere) Private Limited*

P.B. No. 238, DAVANGERE - 577 002, Karnataka.

Phone: 3359-3080

Our Distributors:

ROYAL TRADERS, 13, Gaya Building, 3rd Floor, Majid Bunder Road, BOMBAY-400 003. Phone: 329427  
SHRI RAMKAMAL AGENCIES, 4, 1st Main Road, Gandhinagar, BANGALORE-560 009. Phone: 73266

GOLDEN OPPORTUNITY FOR EXPORTERS AND DOMESTIC CONSUMERS

For Your Requirements of Superior Quality

## Gamma Acid, G. Salt, R. Salt and K. Acid

Contact Manufacturers:

### Rupani Dyes Intermediates Pvt. Ltd.

362, Mangaldas Building No. 5, 2nd Floor, Kitchen Garden Lane,  
BOMBAY 400 002.

Tel. No. Bombay Office: 312246/255228

Tel. No. Kurla Office: 5137672/5123025

Factory: Plot No. 149, G.I.D.C., Vapi 396 195, Dist. Bulsar, Gujarat.

Tel. No. 747/929



# ETHYLENEAMINES

Your indigenous source of supply

Ethylenediamine (EDA)

Diethylenetriamine (DETA)

Triethylenetetramine (TETA)

Tetraethylenepentamine (TEPA)

Piperazine (PIP)

Higher Polyamines Mix (PA)

Recognised through following prestigious Awards :

- Sir P.C. Ray Award 1985 for development of Indigenous Technology

- ASIA Award 1986

- EUROPA Award 1987

.... march continues

For guaranteed quality and assured quantity...

please contact



**DIAMINES AND  
CHEMICALS LIMITED**

Regd. Office :

In the Premises of

The Bharat Vijay Mills Ltd., Kalol (N.G.) 382 721

**Ahmedabad Head Office :**

1, National Chambers,  
2nd Floor, Ashram Road,  
Ahmedabad-380 009  
Phone 409626  
Gram DIAMINES

**Baroda (Works) :**

Plot No. 13, P.O. Petrofils,  
Dt. Baroda - 391 347,  
Phone: 73305/73406,  
Grams: DIAMINES,  
Telex: 0175-352 DACLIN

**Bombay Office :**

Mittal Towers, C Wing,  
8th Floor, Nariman Point,  
Bombay 400 021  
Phone 232267  
Gram CELAGAR

**New Delhi Office:**

Joshi & Associates  
20, Ansari Road, Near Fire Station  
Darya Ganj, New Delhi 110 002  
Phone: 263502.  
Gram MARTALUMIN.



NO DELAY -- PROMPT DELIVERIES

# ALUMINIUM CHLORIDE ANHYDROUS

MANUFACTURERS:

## ARONI CHEMICALS

(PROP. ARONI COMMERCIAL COMPANY LTD.)

### REGD. OFFICE

29, Bank Street, 1st Floor  
Fort, Bombay - 400 023  
Phone: 2862453/2863021  
Gram: METALDIST  
Tlx: 011-6554 MINA IN

### REGIONAL OFFICE

38, Urmi Society,  
Productivity Road  
Baroda - 5.  
Phone: 325953

### WORKS

Birlagram  
Nagda (M.P.)  
PIN. 456 331  
Phone: 104/283  
Gram: NIYATI

### New Technique in Discharge Printing

Eliminate use of Rangolie DS, Sapholin Stannous Chloride etc. and bring down cost of process.

Use:

**SUDIROL DCS** (as accelerator)  
**SUDIROL DCP** (as padding accelerator)  
**SUDIROL LA** (for Loop ager)

### Attention Bleachers:

Reduce consumption of Hydrogen Peroxide by 20%

**Eliminate/Reduce** consumption of Sodium Meta Silicate

**Eliminate** consumption of Caustic Soda

Use **HP CATALYST** for both Hot/Cold Process

For further details contact:

## M/s. DINA DYESTUFFS

Admn. Off: 327, Nawab Bldg., 4th Floor, Dr. D.N. Road, Fort, Bombay 400 001  
Tel: 2041567/68

### PETROLEUM ETHER (L.R./A.R.) 40-60°/60-80°/60-95°/80-100°/80-120°/95-110°/100-120°

<b>n-HEXANE</b> (65-70°)	<b>EMULSIFYING WAX</b>	<b>n-HEPTANE</b> (90-100°)
Ethyl Acetate	Methyl Acetate 98%	Iso Amyl Acetate (Perfumery Grade)
Ethyl Butyrate	Amyl Butyrate	Schaeffer's Acid (As Sodium Salt)

Also Available in Bulk L.R./A.R. Grades

CYCLOHEXANE \* XYLENE 138°-142° (Rectified -- Sulphur Free) \* TOLUENE (Rectified Sulphur Free) \* DIMETHYL FORMAMIDE \* CYCLOHEXANONE \* ACETONE \* ACETIC ACID  
BENZENE \* ISOPROPANOL \* METHANOL

For MODVAT benefit excise gate pass will be issued

Contact Manufacturers:

## STERLING ORGO & INORGO CHEMICAL PVT. LTD.

Regd. Office: 340/42, Samuel Street, Raut Chamber, 4th Floor, Bombay 400 003.

Phones: 333601/333602/338722; Resl: 352625/364354/8114061

Factory: Plot AF-1, Cama Industrial Estate, Walbhat Road, Goregaon (East), Bombay - 400 063.  
Phone: 699458/6884593



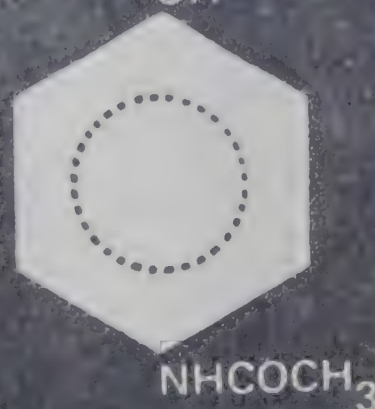
# PARACETAMOL

IP/BP

## CHEMICAL Formula

Acetaminophen  
 4' — Hydroxyacetanilide  
 P — acetylaminophenol  
 N — Acetyl p-aminophenol  
 P — acetaminophenol  
 P — acetamidophenol

## STRUCTURAL Formula



## MANUFACTURAL Formula

# farmson

## THE PERFECT PRODUCT OF

# farmson

## Pharmaceutical Gujarat Pvt. Ltd.



**Head Office :** Shankar Bhuvan, Sayaji Gunj, Vadodara-390 005, Phones : 65636, 64169. Gram : FARMSON

**Works :** 98/1-2-3-4, GIDC Industrial Estate, Nandesari, Dist. Vadodara. Phone : 219

**Research Centre :** At Narpura, Post Baska, Tal. Halol, Dist. PANCHMAHALS

**SALES OFFICES :**

**Bombay :** 404, Embassy Centre, Nariman Point, Bombay 400 021, Phones : 231144, 230383. Gram : KEKEVI

**Hyderabad :** 1-1-700/B-1, New Bakaram, Hyderabad-500 380. Phone : 65836. Gram : FARMSON

### Regional Representatives

- KHOKHANI ASSOCIATES, 3rd Floor, Keshav Baug, 116-Princess Street, BOMBAY-400 002  
Tele. No. 252244, 252680
- PAN ASIAN Commercial Corporation, 4, Rabindra Sarani, CALCUTTA-700 001  
Tele. No : 277595-475047, Cable : PANASIAN
- B&I Enterprise, Cama Building, 2nd Floor, 24/26 Dalal Street, BOMBAY-400 023  
Tele. No : 271964
- NEELGIRI AGENCY, B-5, Shivlok House-1, Karampura Comm. Centre, Opp : Milan Cinema,  
Najafgarh Road, NEW DELHI-110 015. Tele. No : 5413818

NIRMAL

# The Biggest Manufacturer of India



**Cyclohexanone**  
**Mix. of Cyclohexanone**

**Cyclohexane**  
**Cyclohexanol**

MANUFACTURED BY:

**Gujarat State Fertilizers Co. Ltd.**

BARODA

Please Contact Authorised Distributors:

**Crescent Chemicals**

**Sales Office:**

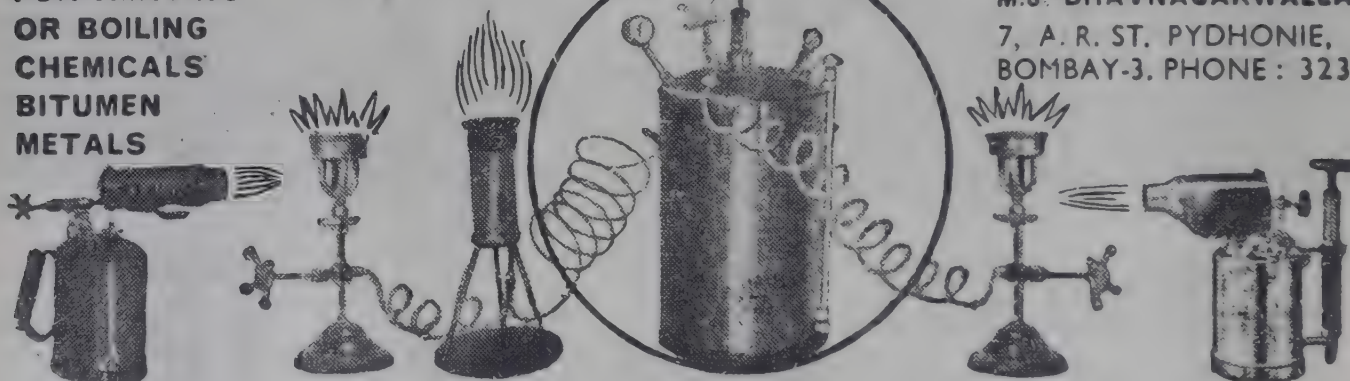
56-B, Sanjay Bldg., No. 5, Mittal Estate  
Andheri-Kurla Road, Bombay 400 059.  
Tel: 6329110/6322136/6300157/6343555  
Telex: 011-72284 CRES-IN  
Grams: CRESOLVE, Bombay - 400 009

**Branch:**

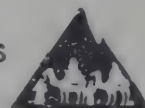
5-E, Vasant Kutir,  
R.C. Dutt Road.  
Baroda - 390 005.  
Phones: 324313/322279/320128  
Grams: CRESCHEM, Baroda 390 005

**CARAVAN**  
**HEATING EQUIPMENT**

**FOR HEATING  
OR BOILING  
CHEMICALS  
BITUMEN  
METALS**



A Product of  
CARAVAN INDUSTRIES



Distributors

**M.J. BHAVNAGARWALLA**  
7, A. R. ST. PYDHONIE,  
BOMBAY-3. PHONE: 323'51

ALSO AVAILABLE DIESEL FIRED "BHATTIS"

For your requirements in following items

**MONO CHLORO BENZENE**  
**TRICHLORO BENZENE**

**PARA DICHLORO BENZENE**  
**ORTHO DICHLORO BENZENE**

ALSO INTERESTED IN PROCESSING AND NEW ITEM MANUFACTURING

Contact: MANUFACTURERS & EXPORTERS

**HASSIJA**

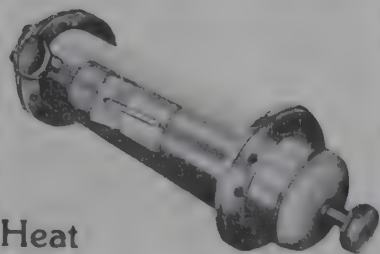
**HASSIJA ORGANICS PRIVATE LIMITED**

21, Sindhu Building, 'G' Road, 87, Marine Drive,  
BOMBAY 400 082.

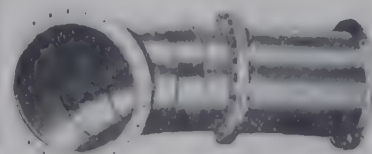
Tele: 296696

Factory: M.I.D.C. Mahad Industrial Area, Mahad, Maharashtra, (India).





Heat  
Exchanger



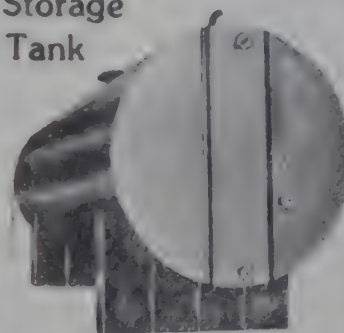
Piping



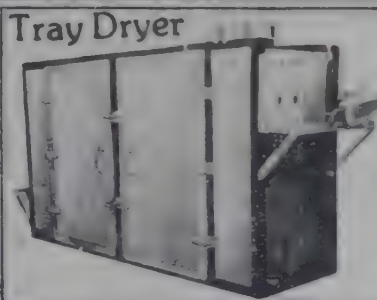
Centrifuge



Reaction  
Vessel



Storage  
Tank



Tray Dryer

OUR RANGE OF PRODUCTS  
Reaction Vessels, Pressure Vessels, Heat Exchangers,  
Centrifuges, Tray Dryers, Storage Tanks etc.

# texma engineers

MECHANICAL, CHEMICAL & STRUCTURAL ENGINEERS

Works:

B-3, GIRIRAJ IND. ESTATE,  
MAHAKALI CAVES ROAD, ANDHERI (EAST),  
BOMBAY - 400 093.

GRAM: TEXVESSELS.

TEL. FACT. 6320667

Associates: **VENUS ENGINEERS**



**FOR EXCELLENT QUALITY & REGULAR GUARANTEED SUPPLIES AT COMPETITIVE RATES:**

MEGALDRATE USP  
MAGNESIUM TRISILICATE IP  
MAGNESIUM HYDROXIDE USP\*  
PRECIPITATED SILICA  
MAGNESIUM STEARATE IP

MAGNESIUM CARBONATE LIGHT IP  
DRIED ALUMINIUM HYDROXIDE GEL IP\*  
MAGNESIUM ALUMINIUM SILICATE  
DI-CALCIUM PHOSPHATE  
ZINC STEARATE IP

\* Also available in Paste Form

CONTACT MANUFACTURERS



**Quality**  
CHEMICAL INDUSTRIES

4-C, Bajaj Road, 201, Dhiraj Kunj, Off Dadabhai Road, Vile Parle (West), Bombay-400 056.  
Phone: 25-1952, 25-8371 (Office); 632-1032 (Residence)  
55, Canning Street, B-Block, 3rd Floor, Room No. 67, Calcutta-700 001.  
Phone: 26-6148, 26-9953 (Office); 31-2108 (Residence)  
FACTORY: 108-A, GIDC, Phase-I, Chitra, Bhavnagar. Phone: 5737

## AVAILABLE

Zinc sulphate (solution, hydrous, anhydrous), Copper Sulphate (solution, crystal, powder), Copper Oxide & Powder suitable for mfg. Copper Sulphate & Copper Carbonate. Zinc Oxide & Zinc Hydroxide suitable for rubber industry containing 30% to 95% ZnO. Zinc Oxide (off Colour) suitable for mfg. Zinc Acetate, Zinc Nitrate, Zinc Carbonate, Zinc Stearate etc. Zinc Ash suitable for mfg. battery grade Zinc Chloride, Zinc-Copper Ash (Brass Ash) suitable for mfg. fertilizer grade Zinc Sulphate.

For Your Requirements Please Contact:

## METALS & CHEMICALS TRADERS

3, Adarsh Building, Ground Floor, 9/83, Nehru Road,  
(Opp. Ram Krishna Hotel), Vile Parle (East), Bombay - 400 057

Telephones: (Mr. Raju Doshi)

6124333/6126321

Telegram: "METCHEMTRA"

VILE PARLE, BOMBAY-400 057

FOR YOUR BULK REQUIREMENTS OF:

**T.R.O. (Turkey Red Oil)**

**Sodium Lauryl Sulfate**

**Sodium Lauryl Ether Sulfate**

**Triethanolamine Lauryl Sulfate**

**TEBA (Phase Transfer Catalyst)**

Please Contact Manufacturers:

# SWAPNA CHEMIE

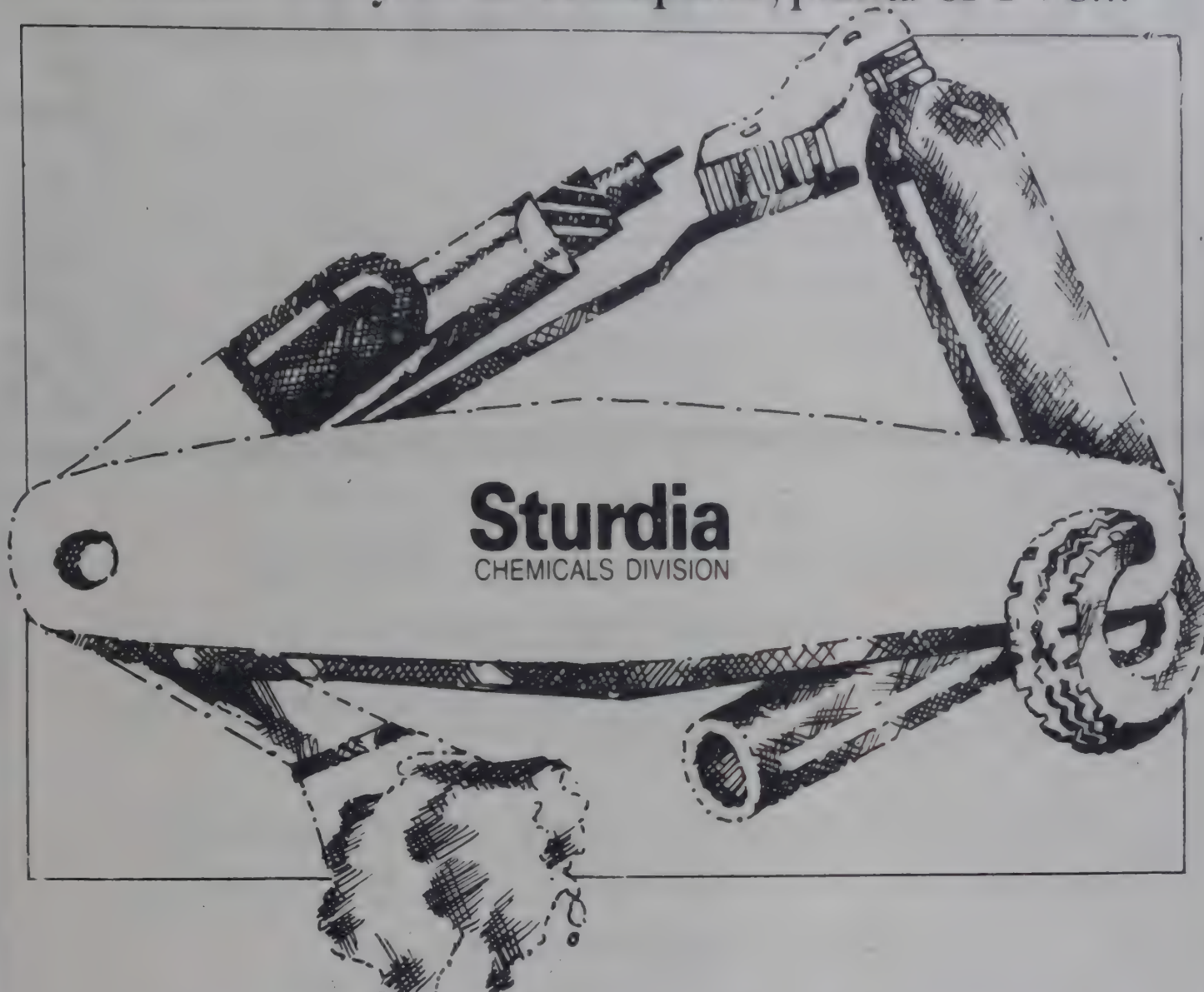
25/160, D.N. Road, Fort, Bombay 400 001.

Telephone: 2047713

OTHER PRODUCTS OFFERED: TRIACETIN, CABS



Whether it's tyres or toothpaste, paints or PVC...



## Sturdia Calcium Carbonate

### Quality is our cutting edge

Leading names in the industry will testify to the quality of Sturdia Calcium Carbonate.

As India's largest manufacturer, Sturdia meets the needs of industries ranging from cables, tyres, PVC pipes, rubber goods and paints to toothpaste, drugs, cosmetics and printing inks. The list continues to grow.

Sturdia has now introduced a new grade-Forcal 'C' which is being extensively used in the manufacture of rigid PVC pipes.

**Sturdia**  
CHEMICALS DIVISION



**CITURGIA BIOCHEMICALS  
LIMITED**

Regd. Off: Neville House, J.N. Heredia Marg,  
Ballard Estate, Bombay 400 038 Tel: 268071  
Gms: CITURGIA BOMBAY,

Tlx : 11-73372 BOM IN



# GLUCONATES

**If you are losing  
the battle against  
quality and delivery .....  
..... shield with Shan-Par**

- Calcium gluconate IP
- Calcium boro gluconate
- Ferrous gluconate IP
- Gluconic acid
- Magnesium gluconate
- Potassium gluconate
- Sodium gluconate

**SHAN PAR INDUSTRIES**

A2-303/5, G.I.D.C. Estate  
P.O. Box No.777  
Baroda 390 010

Phone : 43119, 43377, 43265  
Gram : SHANPAR

**Shan-Par**

FOR PROMPT SUPPLIES OF

## **Anhydrous Ammonia Gas & Liquor Ammonia**

**In 60 kgs. & 40 kgs. CAPACITY CYLINDERS AND 5 MT/7MT/9MT TANKERS**  
Also Available New Cylinders For Ammonia & Chlorine Duly Approved by C.C.E. Nagpur  
and Certified by ISI, New Delhi.

BRANCHES AND ASSOCIATE ALL OVER INDIA

Please Contact:

### **Ammonia Supply Company (Bombay)**

22B, B.S. Marg, Above George Restaurant, 2nd Floor, Fort, Bombay 400 023.

Phones: Office: 271914, 272245 & 274526; Resi: 6289566; Godown: 4307473 & 4300205

### **Asco Engineering Co.**

Sodagar Ice Factory Compound, University Road, Baroda 390002.

Phone: Office: 328603 & 328239; Resi: 21860

For your Requirements of:

## **EDTA, NTA and their Salts**

Used in Agriculture, Textile, Rayon, Soaps and detergents,  
Rubber, Paper, Leather, Pharmaceuticals, Electroplating,  
Photography, Water-Softening, Paints, Plastics,  
Resins, Cosmetics and Various other Industries as  
Chelating / Sequestering / Metal Complexing Agents.

please contact manufacturers :-



### **CHEMOFINE INDUSTRIES**

138, MADHANI ESTATE, 542, SENAPATI BAPAT MARG,  
DADAR (W), BOMBAY: 400 028.

Tel. Office: 4229932. Residence: 4220392.

(Factory at Chembur, Bombay.)



**AVAILABLE REGULARLY FOR EXPORTS**

**VAT DYES**

**VAT PASTES**  
(Micro Disperse)

**SOLUBILISED VATS**  
(Indigosols)

**FAST COLOUR SALTS**  
(FAST BLACK K SALT -- OUR SPECIALITY)

**SOLVENT OR OIL SOLUBLE DYES**

**DYES INTERMEDIATES**

**1:4 DIAMINO ANTHRAQUINONE**

**LEUCO 1:4 DIAMINO ANTHRAQUINONE**

**QUINIZARINE**

**LEUCO QUINIZARINE**

**6-CHLORO-4-METHYL-3(2H)-THIONAPHTHENEONE**

**2:3 DICHLORO 1:4 DIAMINO ANTHRAQUINONE**

**6-ETHOXY-3(2h)-THIONAPHTHENEONE**

Contact Dyes Division



**arlabs Ltd.**

6, Malhotra House, 2nd Floor, Opp. G.P.O.,  
BOMBAY 400 001.

Telephone: 262077-78-79 \* Telex: 73698 RLAB IN  
Telefax: 263234



SINGLE SOURCE OF MINERALS FOR YOUR INDUSTRY

White Iron-Free Silica — Any Mesh upto 700 Micronised Extenders — like :  
Barytes, Calcite, Talcum, China Clay, Whiting Red Oxide, Etc

Utox — Substitute For  $TiO_2$

## Gurukrupa Overseas Trading Corporation

407, Vyapar Bhavan, 4th Floor,  
49, P. D'Mello Road, Bombay-400 009  
Tel. : 333488/321592

RELIABLE HOUSE FOR QUALITY AND SERVICE

## SURFACTANTS

- \* Ethylene Oxide Condensates
- \* Nonionic and Anionic Emulsifiers Wetting Agents
- \* Antistatic Coning Oils for Synthetic Fibre/Yarn
- \* SLS, SLES, TEALS, Cocodiethanolamide
- \* Dioctyl Sodium Sulfosuccinate (DOSS)
- \* Calcium Salt of Alkyl Benzene Sulfonic Acid (CABS)
- \* Liquid Detergents for Industrial use
- \* Speciality chemicals tailor made to Customer's requirement

Contact

## UNITED PESTICHEM & NONIONICS PVT. LTD.

'AHURA', 84, Sion Road, Sion (East), Bombay - 400 022.  
Phone: 474295/96; 473355

ESTABLISHED 1968

NO COMPROMISE ON QUALITY WITH  
**BHAVNA'S**

# SILICA GEL

(Indicating & Non-Indicating Type)  
Column Chromatography  
Thin LAYER Chromatography

MANUFACTURED BY

## Bhavna Chemical Industries

51, Vithal Udyog Nagar, Vallabhvidhyanagar, Gujarat - 388 121  
Tel. No. Fact: 30243    Resi: 30712    Bombay Contact Tel. No. 507507  
VALLABHVIDHYANAGAR STD CODE NO IS 02692



CONSUMERS & EXPORTERS CONTACT FOR YOUR REQUIREMENTS OF

# **Nitrobenzene-3-Sulphonic Acid Sodium Salt**

## **(RESIST SALT)**

CONTACT MANUFACTURERS:

### **Ganesh Chemical Industries**

74, Matru Smruti, Road No. 4, Scheme No. 6, Sion (East), Bombay 400 022.

Phones: 477431/477432/477433

FOR

**DIPHENYL METHANE  
BENZHYDRYL BROMIDE  
BENZOPHENONE  
DIPHENHYDRAMINE BASE  
BROMOBENZENE**

Contact the Manufacturers:

### **SUMEEKA CHEMICALS PVT. LTD.**

Apeejay Building, 4th Floor, B.S. Marg, Fort,

BOMBAY 400 023.

Tel.: 224084 (3 lines) 244652/242703

Telex: 011-4158 KMTX IN

Cable: "CHEMTREE"



## ALWAYS AVAILABLE

HYFLOSUPERCELL  
DICALITE  
CITRIC ACID  
PECTIN

MELAMINE  
PHENOL  
PARAFORMALDEHYDE  
BUTYL ACRYLATE

LITHOPONE  
HYDROGEN PEROXIDE  
FORMIC ACID  
TARTARIC ACID

Please Contact:

### B.I. MEHTA

15, Gurukrupa, 30, Bhagat Singh Road, Bombay 400 056.

Phone: Resi: 6361220/6361221. Office: 320343/347879.

Gram: 'BHASKARKEM'.

Telex No. 011-75617 MNCB IN

**WE ALSO BUY/SELL REP-EXPORT HOUSE LICENCE**

For most competitive quotation, best quality, prompt delivery  
and after-sales service for following items

EUGENOL  
CLOVE OIL (Rectified)  
CLOVE OIL (Pharma Grade)

CINNAMON OIL  
LEMON OIL  
ORANGE OIL

**FOLDED OILS**

Please Contact Manufacturers:

### CHEMICAL PROCESS CONSULTANTS

Unit 202, Adarsh Ind. Estate, Sahar Road, Chakala, Andheri (East),

BOMBAY - 400 099

Tel: 632 5855

Gram: KEMIPROSS

AVAILABLE AT MOST COMPETITIVE RATES

# ACID SLURRY

SOFT AND HARD ANY QUANTITY



**KRIPA CHEMICALS PVT. LTD.**

**Admn. Office:**

8/9/10, 'Royal Chambers',  
S.No 47, Paud Rd., PUNE-411 038  
Phone: 433245

**Branch Office:**

House No. 1024, 10th Main Road,  
West of Chord Road,  
IIIrd Stage, 1st Block, BANGALORE-560 079



For Your Regular Requirements Of:

**PYRIDINE GRADE 1 A (Min. 98.5%)**

(Original Packing of 25 kgs. & 50 kgs).

**HYDRAZINE HYDRATE 80%**

**2-CHLORO PROPIONIC ACID\***

**PIVALOYL CHLORIDE\***

**POTASSIUM CARBONATE 99%\***

**EPICHLOROHYDRINE\***

**DI METHYL FORMAMIDE\***

**DI METHYL ACETAMIDE\***

**2-ETHYL HEXANOIC ACID\* (OCTOIC ACID)**

**AEROSIL - 200\* (DEGUSSA)**

\* (For Actual Users only -- WITH MODVAT BENEFITS).

-- Manufactured by  
Warner - Hindustan

-- France Origin

-- U.K. Origin

-- U.S.A. Origin

-- France Origin

-- Japan Origin

-- U.S.A. Origin

-- German Origin

-- Sweden Origin

-- German Origin

Kindly forward trade inquiries

**HASMUKHRAY & CO.,**

198, Mangaldas Building No. 3B, Mangaldas Road, Bombay 400 002

Tel. Nos. 31-7815/29-2386/25-8137/25-1744

Cable: JAYJANAK

Telex: 11-2192 JAY IN

Hyderabad: Telephone Nos. 73604/840408

## A WIDE RANGE OF GLASSWARE FOR VARIOUS INDUSTRIES

### SPECIALISTS IN :

- 10 L. to 200 L. all glass Reaction and Distillation units — HCL absorbers upto 12" — Heat Exchangers, Columns, Bends, Valves, Reducers, Reflux Ratio Heads upto 12" diameter etc. — Complete structure and fittings
- Erection and Installation of glass units — Laboratory/Research interchangeable glass apparatus and units — Ready Stock : 100L. 200L vessels all types of imported QVF type column components, 9" 12" 18" — Oil bath and water bath with leakproof.

### We undertake repairing of :

- 20 L to 200 L flask, Heat Exchangers, R.H.M., R.D.A., Tee, Column Sections upto 18"

### We supply all glass parts for the following plants

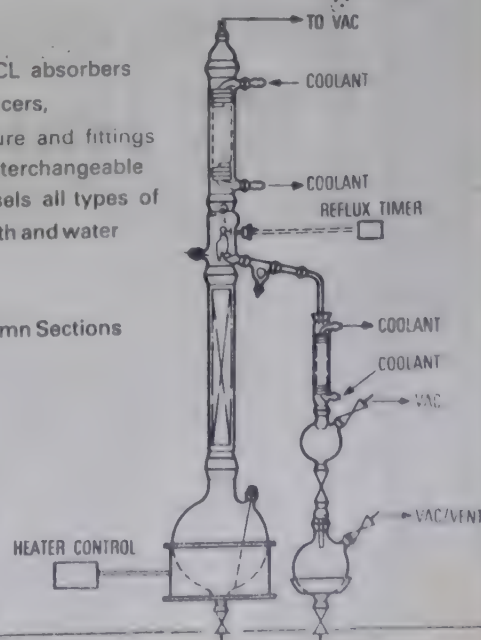
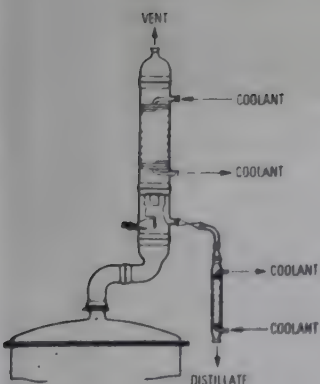
- |                           |  |
|---------------------------|--|
| Fine Chemical Plants      | Benzene manufacturing                          |
| Breweries & Distilleries  | Pesticides & Insecticides                      |
| Organic & Chemical Plants | Pharmaceutical & Chemical                      |
| Dye Chem Industries       | Pilot Plant for Research & Development Centre. |

**Super**

**Scientific Glass Industries**

E-66 Sardar Industrial Estate, Ajwa Road,

Baroda 390 019. Phone : 556188 Gram : 'Super Glass'





**SODIUM SULPHIDE Flakes**  
(Iron Free)

**CAUSTIC SODA Flakes**

**CAUSTIC POTASH Flakes**

**CHLORO SULPHONIC ACID**



**SHREE ENTERPRISES**  
(CHEMICALS) PVT. LTD.

A Shree Group

801, Dalamal Towers, 211, Nariman Point, BOMBAY-400 021.  
PHONES: 231336 □ 231308 GRAM: "ANHYDRIDE" TELEX: 011-5179



# CHEMICAL WEEKLY

VOL. XXXIII

AUGUST 23, 1988

NO. 50.

## Magnesium the Magic Metal from the Sea

The world production of Magnesium stood at 300,000 tonnes in 1981. As of today, it is about the same but may reach 400,000 tonnes soon, if not by the turn of the century.

India uses upto 1,000 tonnes of magnesium metal every year and the whole tonnage is imported. Consumed by both strategic as well as conventional industries magnesium has probably one of the widest application for metals.

The raw material for the process used is sea bitterns containing magnesium chloride. The metal is produced by the electrolysis of magnesium chloride mixed with other salts in molten state at temperature of  $700^{\circ}\text{C}$ , when magnesium metal is produced; metal is of 99.8% purity and is suitable for making coins. The energy consumption is only 15 KW/Kg.

Magnesium metal is extracted from sea water where it is found as much as 0.11 per cent i.e. about 1 kg in every tonne of sea water and since some 1333 cubic kilometers of sea water float over our earth, it has been estimated that industry could use 100 million tonnes of magnesium each year for a million years without using up its supply.

The first magnesium plant in India was set up at Jamshedpur by the CSIR mainly with a view to develop indigenous technology in India. Efforts to transfer this technology to Indian parties were not successful. A number of public sector organisations including Bharat Aluminium Company, Hindustan Aluminium Company and Bihar Industrial Development Corporation were reported to be interested but nothing emerged. The latest reports indicate that Andhra Pradesh Industrial Development Corporation are evincing interest.

An entirely indigenous production process has been developed by the scientists working at Central Electrochemical Research Institute (CECRI), Karaikudi, in Tamil Nadu and has been satisfactorily tested producing about 30 tonnes of Magnesium metal to the fullest satisfaction of the consumers. A prototype plant for the production of magnesium by fused salt electrolysis has been set up during 1985 at DMRL Hyderabad as a joint development project by CECRI. The plant was commissioned and operated steadily for four months at the production rate of 100-150 Kg/day with a current efficiency of 70%.

India's first magnesium plant based on indigenous CECRI technology has been planned to be set up at Valinokkam in the backward Ramanathapuram district of Tamil Nadu. This six crore plant utilising sea bitterns as the raw material has an annual targetted capacity of 600 tonnes.

Magnesium is not a consumer product and the average man may think it is far removed from his daily life but in actual fact we are surrounded by it in many forms. It is in our medicine chest as Epsom Salt or Milk of Magnesia. It forms light weight housing of many machines. It is used in making metal suitcases, binoculars and cameras. Its light weight makes it ideal for hard tools, sports gear and the like. The uranium plant of the Atomic Energy Commission consumes upto 100 tonnes of Magnesium per year.

It is also used in making automobile parts. Lighter than the common metal aluminium, it goes into some automobile engine parts and racing cars have used magnesium alloy wheels for



several years. The Swedish car manufacturing company Volvo recently developed a prototype engine containing nearly 50 kgs of magnesium in alloy form. It is also used by the die casting industry and in the production of strategic metals like beryllium, titanium, zirconium and uranium. Magnesium metal powder is an essential raw material for the pyrotechnic industry which flourishes at Sivakasi in the Ramanathapuram district of Tamil Nadu.

The annual requirement of magnesium powder is about 200 tonnes a year and is made by three manufacturers in India out of the imported metal. India is reported to be the only country in Asia to possess the technology to manufacture magnesium powder.

A material finding increasing popularity in pyrotechnics is the 50/50 alloy of magnesium and aluminium termed magnalium. The Chinese make wide use of magnalium in fireworks items to produce attractive white sparks and cracking effect.

Magnesium is a very reactive metal and makes an excellent fuel under conditions. Magnesium metal is found in most white light formula. In an oxidising flame the metal is converted to the high melting magnesium oxide,  $MgO$ , an excellent white light emitter. Also the high heat output of magnesium containing compositions helps in achieving high flame temperatures.

With the advancement of naval technology the demand for power sources of varied nature has grown leaps and bounds during the last three decades. The need for primary, activated and secondary batteries is enormous today. The submarines make use of a very high voltage and high ampere hour capacity batteries for their operation. A large number of equipment used for monitoring the signal for detection of submarines and other undersea units need activated batteries.

Magnesium-Silver Chloride, Magnesium-Cuprous chloride batteries are useful systems. In this type of application in recent years magnesium-lead chloride battery systems developed by CECRI are gaining in importance.

The torpedo is an undersea weapon which needs high power for a short duration of four to

six minutes. The battery system has to be most reliable to secure precision targetting and cost is of secondary importance. Presently magnesium — silver chloride battery is being used for application in sea to sea battle.

Magnesium is mostly used to produce aluminium alloys. A mere pinch of magnesium makes aluminium both stronger and easier to draw to great length and thinness. Light and ductile, it is one of the easiest of all metals to machine. A cutting tool shaves a thin edge off a huge slab of magnesium as a housewife slices bread. Heated to nearly  $200^{\circ}C$  and passed through a die, it assumes virtually any shape in less than two minutes.

Until 1930, there was a lack of interest on the part of large potential users like the aircraft and automobile industries. German air attacks on London during World War II changed the tide. British aeronautical experts, at a loss to account for German Luftwaffe speed and bomb-loads, discovered by examining downed German planes that magnesium-aluminium alloys were a major structural material in the German aircraft.

Today almost 50 years later, magnesium has found thousands of uses in the industry. It is used in many ultra light weight chainsaws that a lumberman can carry suspended from his hip pocket, hold in one hand and use it to fell a 40 cms. diameter tree in a few minutes. One magnesium ramp is so light and strong that a 10 tonne truck can drive up on it, yet so light that a man can carry it away. It is widely used in satellites because its lightness enables a space vehicle to reach orbit with hundreds of kilograms more instrumentation. When Mariner III was unsuccessful because of failure of its fibre glass shroud, spacecraft designers replaced this with magnesium metal and Mariner IV sailed past the planet Mars on schedule.

Magnesium alloys are increasing the speed and payloads of aircrafts on duty in any war. Because nearly 300 magnesium parts are put in any tactical fighter they can carry nearly three tonnes of arms including cannons, guided missiles, bombs and rockets. Thus the greater payload per kilogram on any supersonic aircraft in service today. The navy uses a torpedo that leaves

(Contd. on p. 44)



# CHEMARENA

S. L. VENKITESWARAN

## T. & L. move into U.S.A.

Tate and Lyle of U.K. one of the largest producers of sugar is bidding for Staley Continental of USA, one of the largest HFCS producers. This could give them a share of 15% of US sweeteners market (up from 6 percent).

Staley have a large business in Food Service business which will be sold off if T & L acquire it. But Staley shareholders are not likely to oblige.

## Animals get patent coverage

US Patent office has issued the first patent for a genetically altered animal to Harvard University, US Pat 4736866. This covers a mouse designed to be particularly susceptible to cancer and thus help in testing carcinogenicity of chemicals and help in the design of newer cancer therapies. The patent covers 33 oncogenes from different animals ranging from chicken to human beings. The cancer causing agents can be inserted into mouse germ cells immediately after fertilisation to make the progeny highly susceptible to the particular form of cancer including breast cancer and leukaemia. There are said to be 21 more applications with the US Patent Office. A number of transgenic animals have been produced including a mouse that se-

retes a blood clot dissolving drug in its milk, an overgrown mouse incorporating rat growth factor genes and a cross between a goat and a sheep called a geep.

It was a year ago that the Patent Office ruled that animals could be patented. Patent coverage for genetically altered microbes was first issued in 1980 to set the ball rolling for modern biotechnology. There is much criticism on the latest decision particularly by animal groups and a Bill to hold up such patents for 2 years is before Congress. Industrial Biology Association welcomes the Patent and expects this will open up the area by published information instead of under-warp trade secrets (Source: Chemical Week of 20.4.1988).

## Biomass gasification

Battelle Labs. in USA have released their specially developed knowhow on thermal biomass gasification to an engineering company for exploitation. Biomass contains a lot of water and requires a lot of energy to get them to dry before they can be processed. But Battelle have overcome this by *in situ* reaction of a 90% water slurry in the presence of a proprietary transition metal catalyst. The slurry is pumped into the reactor and at 350-450°C and pressures of 2000-4000 psi, the biomass is gasified in solution. The pressure prevents evaporation and the

gases are separated downstream to emerge as a medium Btu methane/carbon dioxide mix which can be used for process heat or generation of electricity. The surplus energy generated is claimed to be large. Bench scale continuous treatment of wide variety of wastes from breweries, potato peels, grape pomace etc. The catalyst is suspended in a spinning basket in the reactor. It is expected that the engineering company will first design and build a mobile 5 t/day wet pilot plant for detailed engineering of a 10,000 gallons/day plant.

## Caustic Soda prices soar

There has been concern at the large increases in the price of petrochemicals and polymers but the price rise has extended to other chemicals — notably to caustic soda. In Europe the price is of the order of \$ 500 per tonne for

spot sales and \$ 200 for the running contracts. Spot prices have doubled in the past few months. Contract prices are expected to move up further to \$ 230/240. US prices have also moved up and so too in Japan where it has gone up to \$ 422 to



528/mt. Japan has a huge export to Australia for aluminium production in joint ventures. Production in Japan was a record 3.2 million tonnes last year. World alumina production has risen to 28 million tonnes and is moving up 4% a year. European spot sales of 20000/30000 tonnes have gone to USA. European production is at full capacity level of 8.6 million tonnes. Suddenly caustic soda is more valuable than chlorine.

A consequence of the jump in prices in USA is that producers are being hauled up for price fixing in a class action suit by one of the pur-

chasers. Of twelve producers six have settled for payment of \$11.9 million but six others are not interested and the case may go for trial. The six include Dow Chemicals. Long term contract price from the middle east have gone up from a distress level of \$45 to 50/te in Jan. 87 to three times that price. Producers can get \$275-290/te and maybe \$300 in a short term. We were so worried about dumping price levels from Saudi Arabia where chlorine for EDC left a lot of caustic at ridiculous price levels of \$45/te cif Indian port and raised the cry for heavy customs levies. Such a situation is unlikely to arise again.

## Enzymes in organic solvents

Enzymes being the active catalysts of bio-reactions act in aqueous medium but apparently they can remain active in some aqueous-organic solvents as well. There have been reports of lipase activity in organic solvents. Now the action of horseradish peroxidase in water-miscible organic solvents is reported from scientists of the University of Iowa. Peroxidases catalyse biosynthesis of lignin in plants which in essence is the biosynthesis of high molecular weight phenolic resins. Use of the peroxidase to synthesise phenolic polymers in aqueous medium failed presumably due to the solubility problem and molecular weight attained was below 500. Now 85% dioxane with water helps the generation of polymers from phenol with molecular weight of 25000 and with no formal-

dehyde needed. The enzyme is not active in pure dioxane. Horseradish peroxidase is more active in solvents like methanol and dioxane mixed with water. This enzyme is said to be readily available at low cost for large scale uses.

Some powdered enzymes suspended in organic solvents have shown activity and show also novel properties. Chymotrypsin which catalyses hydrolysis of peptides in aqueous solution promotes transesterification of amino acids in a variety of anhydrous organic solvents with far less substrate specificity. There are explanations of such strange activity on the basis of substrate enzyme binding characteristics. Some of these enzymic reactions can alter the face of synthesis of bio compounds in future.

## Geotextiles

Plastic fibremats from polypropylene have become very useful to reshape landscape and for construction. Close to 300 million square yards of what are called geotextiles were used last year and an annual growth of 10 to 12% is expected until 1992. Phillips Fiber Corporation, Timberlake, SC, is a leader in this. A Supac Geotextile under a layer of crushed rock strengthens roads built on soft soil. It is used to prevent soil erosion in riverbanks or ocean shoreline — it could be a boon for some of our eroding seashores such as in Kerala. Salt fences to retain sediment that would otherwise pollute the site are very useful. The largest use is to form asphalt overlays absorbing the liquid asphalt beneath the road surface and forming a waterproof seal. Polypropylene is the polymer of choice for geotextiles and is durable and of

lower cost. Geotextiles may be in continuous filaments wound together into yarn and woven into desired shape or separate pieces joined together. Many application of non wovens are being taken over by geotextiles or geomembranes. Landfills and waste sites can be properly handled for lining. For waste sites the fibre mat is unrolled and covered with soil, asphalt or other aggregate and serves as an excellent barrier. A new material called Texsol from France is said to be made by weaving continuous polymer fibres into soil mixtures at the construction site. 35000 m<sup>2</sup> of Texsol is said to have been used already since 1982. There is need to have a detailed study of some of the available geotextiles and methods of application to prevent soil and coastal erosion in India.



FOR COMPETITIVE IMPORTS OF  
Chemicals

Pharmaceuticals

Intermediates

Rubber Chemicals

Pesticides

Printing Inks

From Our Overseas Principals



PLEASE CONTACT WITH YOUR SPECIFIC REQUIREMENTS

# CHEMET

**HEAD OFFICE :**

Taj Building, 1st Floor, P. B. No. 196,  
210, Dr. D. N. Road, Bombay-400 001.

**CALCUTTA OFFICE :**

Sharma House, 3rd Floor,  
1/2, Lord Sinha Road, Calcutta-700 071.

**MADRAS OFFICE :**

10, Kondy Chetty Street, 1st Floor,  
P. B. No. 1709, Madras-600 001.

**DELHI OFFICE :**

214, Hans Bhavan, Wing No. 1,  
Bahadurshah Zafer Marg, New Delhi-110 002

H'bad Off: II Flr., 3-4-874/1/A/7, P.B. No. 1262 Barkatpura, Hyderabad-27. Ph: 60414

Phones : 2043803/4/5/6/7

Fax. No. 2048854

Cable : DEGUCHEM Bombay

Telex : 11 3229/11 4631 DGKM IN

Phones : 447306/446155

Cable : DEGUCHEM Calcutta

Telex : 21 3325 DGKN IN

Phones : 582447/587617

Cable : DEGUCHEM Madras

Telex : 41 7554 DGKM IN

Phones : 3311373/3319787/3319791

Cable : DEGUCHEM New Delhi

Telex : 31 65921 DGKM IN



## RPL will start making EO

Reliance Petrochemicals Ltd. (RPL) is expected to join the list of producers of ethylene oxide (EO) by 1989-90.

Out of its licensed capacity of 60,000 TPA, RPL would require about 40,000 tonnes of glycols for captive consumption of Reliance Industries Ltd. Part of the remaining 20,000 tonnes would be marked as EO depending on the market demand, industry sources say.

In 1990, RPL, along with India Glycols, is expected to contribute around 18,000 TPA of EO. Another 5,000 tonnes will be produced by IPCL's Maharashtra gas cracker complex around the same time. Ethylene is reacted with oxygen to produce ethylene oxide, which is further processed to manufacture monoethylene glycol (MEG) and polyethylene glycols.

Meanwhile, EO consumers, whose products have shown a spurt in demand in the domestic and international markets, have urged manufacturers to step up production. However, against the background of growing demand, relative shortage would continue until fresh capacities are commissioned, industry sources say.

At present, there are only two manufacturers of EO — Indian Petrochemicals Corporation Ltd. (IPCL) and National Organic Chemical Industries Ltd. (NOCIL). IPCL produces around 600 tonnes a month and NOCIL around 900 tonnes.

EO consumers (producers of textile auxiliaries, emulsifiers, pesticides and pour point depressants) have charged that NOCIL and IPCL are diverting EO for the manufacture of glycols. They attribute this to compulsions following worldwide shortage of MEG. Though priced high MEG can be imported, while EO, being a hazardous gas, cannot be imported, according to Mr. M.D. Dhamankar of the Indian Chemical Auxiliaries Manufacturers Association (ICAMA).

A spokesman for EO manufacturers denies the charge that they are giving priority to production of MEG. IPCL produced 7,420 tonnes in 1987-88, 42 per cent more than its production during the previous year. Indeed, IPCL sold more EO by cutting down glycol production, he says. Similarly NO-

CIL put 10,000 tonnes into the market this year as against less than 9,000 tonnes last year.

The spokesman has acknowledged that there has been a shortage of EO of late, caused by the shut-down of IPCL's and NOCIL's production facilities. The recommissioning got delayed because of catalyst change. Both plants have now resumed production. He had denied that there was any pressure to divert EO to manufacture MEG.

He says EO consumers have been highly erratic in lifting supplies of this hazardous gas which has to be consumed early, failing which it will create storage and environmental problems. Only a year ago there were few takers for EO and producers had to offer discounts, he adds.

At a news conference in Bombay recently, ICMA officials said textile exports, which is a major foreign exchange earner for the country, would be adversely affected if the chemical industry is not supplied with EO condensates. EO is also a vital raw material for the manufacture of ethanolamines, glycol ethers, dye intermediates and leather chemicals, all of which are either import substitutes or thrust areas for export.

EO consuming industries employ some 20,000 people, and a majority of the units are in the small sector. According to ICAMA, the industry requires about 20,000 tonnes of EO.

### CRL EXPANSION AWAITS CLEARANCE

Cochin Refineries Ltd. (CRL) which hopes to complete on schedule its aromatic project now under implementation is awaiting Central clearance for yet another expansion programme already submitted to the Government.

The Rs. 80-crore expansion scheme now before the Centre, envisages the increase of the refinery's processing capacity by 1.5 million tonnes a year. The present processing capacity of the Cochin Refineries is 4.5 million tonnes of crude oil per annum. The proposed expansion scheme would help the refinery raise it to six million tonnes.

Talking to a team of newsmen who visited the refinery at Ambalamugal re-

### CORRIGENDUM

In the Advertisement of A-One Chemicals, Published in the Chemical Weekly Issue of 19th July (Page Number 59), the Pincode of Ahmedabad was Wrongly Published. The Correct Pincode Number is 380 001. The Error is Regretted.  
— The Advertising Manager.

cently, the CRL Chairman and Managing Director, Mr. J. Jayaraman, claimed that the expansion scheme could be completed in 13 months. In other words, once the final clearance is given, the refinery's processing capacity would go up by 1.5 million tonnes.

Mr. Jayaraman said that the expansion scheme is being actively considered by the Union Government.

The Chairman stated that by 1988-89, the Cochin Refineries is likely to achieve cent per cent capacity utilisation. The refinery had already achieved 91.36 per cent capacity utilisation last year. The refinery processed 4.1 million tonnes of crude against its capacity to process 4.5 million tonnes, he pointed out.

On the Rs. 85-crore aromatic project Mr. Jayaraman said the work is in progress and is expected to be commissioned on schedule within the approved cost. The project has a capacity to produce 87,200 tonnes of benzene and 12,000 tonnes of toluene in a year.

Besides, the project would also produce 19,250 tonnes of liquid petroleum gas, 6,000 tonnes of petrol and two lakh tonnes of diesel oil a year.

Naphtha produced in the refinery itself is the major raw material for the project.

The benzene unit of the aromatic project is to be commissioned by February next. By August next, the toluene production would also be commissioned.

Mr. Jayaraman informed that the refinery is now installing at a cost of Rs. 10 crores a microprocessor based distributed digital control system. The system made in Japan is to ensure safer operations in the refinery and also to help optimise production.





*For your import requirements of:*

Monoethylene Glycol

Di Ethylene Glycol

Tri Ethylene Glycol

M.E.K.

## PRIYA CHEMICALS

**HEAD OFFICE :**

Podar Chambers, 4th Floor  
S. A. Brelvi Street,  
Bombay-400 001.

Phone : 2860596-2863611-2863470  
2863783-2863900

Telex : 011-5495 PRIA-IN  
011-2472 PODR-IN

**BRANCHES : HYDERABAD OFFICE :**

Prashanthi Commercial Complex, 6-9-30/6 to 8/B  
11th Floor, Basheerbagh, Hyderabad-500 029.

Phone : 236068

**DELHI OFFICE :**

Flat No. 8, 10th Floor, Akash Deep Bldg.  
Barakhamba Road, New Delhi-110 001.

Phone : 3314512  
3310413

**BANGALORE OFFICE :**

Devatha Plaza, 131/132, Residency Road,  
Bangalore-560 025.

Phone : 564027

**MADRAS OFFICE :**

No. 5, Manikeswari, Kilpauk, Madras-600 010

Phone : 663632

**CALCUTTA OFFICE :**

8, Lyons Range, Calcutta-700 001

202571  
Phone : 209853



## HFL may import PTFE resins

The government may not take the extreme step of totally banning the import of polytetrafluoroethylene (PTFE), a raw material for the engineering plastics.

Instead, Hindustan Fluorocarbons Ltd (HFL), the sole manufacturer of PTFE resins in the country, may be entrusted with the task of importing grades which it does not manufacture for the user industry.

This seems to be the government's line of thinking, according to the processors who had a meeting, with HFL authorities to discuss the issues connected with the manufacture of PTFE by HFL.

Mr. M.S. Murthy, adviser (Chemicals), department of chemicals and petrochemicals who attended the meeting, is reported to have told the processors to submit a list of grades of PTFE which are used at present in their units along with their annual requirements of each grade.

He is also reported to have told the processors that if HFL was not in a position to manufacture these grades, the company would arrange for their imports.

The processors fear that the new arrangement may lead to a situation whereby the inefficiencies of HFL would be passed on to the processors by pooling the prices of imported and indigenously manufactured PTFE resins.

Another area of fear, seems to be that in a monopolistic situation achieved by HFL, at the expense of small processors, the prices would be hiked according to the suppliers whims and fancies leading to attrition of the processors margins and ultimately hitting the very viability of these units.

The inability to supply resins at international prices would lead to stifling of export earnings for PTFE finished goods, according to a processor.

The processors, however, were able to get an assurance from HFL that it will go into the lacunae in the import policy regarding the import policy regarding import of certain finished goods of PTFE such as tapes, tubes, sealants, scrap tapes, which at the moment has hit the indigenous units

very badly. HFL has promised to help the processors by representing on their behalf with the various ministries concerned.

Against a world demand of 40,000 tons of PTFE resins of various grades India's demand is only a meagre 200 tonnes. The processors say that this gives no room for foreign suppliers to dump PTFE in the Indian market.

The government's thinking to ban import of PTFE on this ground, is an excuse to cover up for the shortcomings of HFL the processors said. While 50 to 60 grades are available worldwide, HFL manufactures only 11 grades.

Moreover, processors have frequently complained to HFL about the poor quality of the molding grades, dispersion grades and glass filled grades. Though HFL had admitted to the poor quality of its resins to individual processors and also during the meeting, it is yet to take corrective measures to solve the problem.

With most of the supplies of HFL going abegging, because of the inferior quality, the HFL chairman and managing director Mr. H. Krishnamurthy, is reported to have told the processors during the meeting that if their consumption of HFL manufactured resins is not increased, HFL will seriously consider manufacturing downstream PTFE finished goods.

This is bound to affect the market ability of small scale processors and also violate the internationally accepted practice of a resins manufacturer not processing its own end products, the processors claimed.

### PROTEST AGAINST INCREASE IN PRICES OF POLYMERS INDIGENOUSLY

Mr. Anil B. Goradia, President, AI-PMA has issued the following statement to the press:

The periodic increase in the price of raw materials by indigenous manufacturers taking advantage of the shortage of commodity plastics in the international market has now become a common feature. Only about four months ago, IPCL raised the price of LDPE

by Rs. 3/- per kg. Now, it is reported that it is contemplating to raise the price again and this is bound to be followed by other manufacturers. If this trend goes on, the small scale processing units, a majority of which are in the small scale sector, will be driven to the wall as it is not possible to pass on such rises to large end-users. At the same time it will affect several vital applications of the common man. In this situation, the only solution lies in the Government drastically reducing the customs duty on essential raw materials so that the processing units can import their needed requirements. If this is not done immediately, many of them will fall sick and eventually die. At the same time, the Government has also a duty to devise suitable machinery to stop arbitrary increase in prices by indigenous manufacturers especially when the inputs such as naphtha, continue to be available to the petrochemical units at 86/87 prices only from public sector units.

### CONCERN OVER DELAY IN REVISING CRUDE OIL ROYALTY

The Members of Parliament elected from Gujarat have expressed concern over the delay in revising the rate of royalty for crude oil. It is felt that the existing rate of royalty has no reasonable relationship with the market value of crude oil. They said that the rate of royalty should be immediately revised to reflect the current market value on the basis of the principle of net-back value.

The members noted that if the royalty rate is revised on this principle, with effect from the due date, April 1, 1987 the State's financial crisis would be alleviated.

### PROF. N. R. KAMATH MEMORIAL LECTURE

Prof. N. R. Kamath Memorial Lecture by Dr. F. A. Mehta (Chairman, Goodlass Nerolac Paints Ltd. and Forbes Group) on Decaying Cities — Decaying Industries? is to be held at 6.00 p.m. on Thursday, 8th September 1988 at the University Department of Chemical Technology, Matunga, Bombay-400 019. All are cordially invited.



## Plant for "Kevlar" to be built in Japan soon

E.I. Du Pont de Nemours and Toray Industries announced on 8th Aug. that they have decided to proceed with plans for a manufacturing facility for Kevlar (TM) Aramid Fibre in Japan. The continued high growth rate of sales of Kevlar in Japan and Asia, plus the very positive response of customers to several new, second-generation products, has encouraged them to take this step.

In January, 1985, the two companies formed a business relationship on Kevlar in their 50/50 joint venture, Du Pont-Toray, Co., Ltd. (TDC), to market and produce this High Performance Fibre in Japan. Working closely with Du Pont-Toray to sell fibre imported by them from the United States, Toray's "KEVLAR" Department has developed extensive market and product knowledge with Kevlar.

After detailed studies are completed later this year, design and construction of manufacturing facilities for Kevlar will begin. The plant to be built by Du-Toray Co. is currently being planned to be located within Toray's Tokai site in Aichi Prefecture.

Production capacity is projected to eventually reach 5000 tons per year. When this capacity is ultimately installed, it is estimated over 10 Billion Yen (USD 78 million) in permanent investment will be required. Du Pont will license its patented production and product technology for Kevlar and will bring more than 15 years manufacturing experience and know-how to the joint venture.

After construction is complete at the end of 1990, Du Pont-Toray will produce Kevlar Fibre to supply market needs in Japan and other countries in Asia. The plant will have the newest design and the most advanced technologies, including those that were recently demonstrated by Du Pont during the commercial startup of a new manufacturing plant for Kevlar near Londonderry, Northern Ireland, which serves European markets.

Du Pont-Toray's plant will be the third manufacturing facility for Kevlar in the world. Du Pont has been producing Kevlar in Richmond, Virginia, since 1971.

Kevlar is the first and foremost Super Para-Aramid Fibre. It was inven-

ted by Du Pont over 20 years ago and introduced in Japan and Asia in 1974. It has found numerous applications throughout the world in many high performance and highly engineered applications. Kevlar is used as reinforcement for Radial Tyres, Power Transmission Belts, Industrial and Automotive Houses, Advanced Composites for Aerospace and Sports equipment, Friction Products such as brakes and clutches, Speciality Cables, Ropes for safety, fishing and other marine uses, and in Cut, Heat and Ballistic Resistant Protective Apparel.

### SUPPORT ASSURED FOR PETROCHEM UNITS IN ORISSA

The Centre has assured the Orissa Government that it would give all-out support for the development of the chemical and petrochemical industries in the State.

The assurance was given by the Union Chemical and Petrochemicals Secretary, Mr. H. K. Khan, during his meeting with the Chief Minister, Mr. J. B. Patnaik, in Bhubaneswar, recently.

He said the State's plastic industries, which had hitherto been getting only 10 to 15 per cent of their raw material requirement, would henceforth get their full requirement, both from indigenous and imported sources.

He said difficulties faced by Orissa Synthetics Ltd., a joint sector unit in Dhenkanal district, in raw materials procurement and other matters, would be taken care of in consultation with the Industrial Development Bank of India (IDBI), other Central agencies and the State Government.

Mr. Khan gave the assurance that his department would lend full support in case the proposed basic drugs complex is coming up in Orissa. He indicated that the Indian Petrochemicals Corporation Ltd. (IPCL) and Petrofils Ltd., both Union Government undertakings, were providing assistance in various fields in Kalahandi and Koraput districts.

Mr. Khan, who also had a meeting with the Industries Minister, Mr. Niranjana Patnaik, and top officials, also promised that the State's proposal for the setting up of a few petrochemical industries such as biaxially oriented polypropylene (BOPP) would be favourably considered.

FOR THE MOST COMPETITIVE CIF PRICE OF

## ACRYLAMIDE

Please Contact :

MR. DHAIRESH K. SANGHVI

**M/s. Kantilal Sanghvi & Co.**

Union Co-operative Insurance Bldg.,

23, Sir Pherozeshah Mehta Road,

BOMBAY-400 001.

Phone (Office): 2870836/2873217/2873628/2874153

(Resi.): 4226850/4229086

Telex : 11 5725 EXIM IN — 11 3356 EXIM IN

Gram : EXPIM, Bombay



## Antop Hill godown

The proposed chemical godown at Antop Hill at Bombay has been classified as "the most hazardous unit" and an expert committee appointed by the state government has opposed the project.

The state government has kept the report of the expert committee headed by Mr. R. K. Garg confidential. A writ petition seeking cancellation of the licence given to the Antop Hill Warehousing Corporation is pending before the Bombay high court.

Meanwhile, it is learnt that the government, while accepting the Garg committee report, sought further advice on what could be stored in the proposed godown. Based on a list of non-hazardous chemicals given by the Garg committee, the state government permitted the Antop Hill Warehousing Corporation to build its godown. However, the Union government intervened and asked the Maharashtra government to stay the permission granted until further advice.

Though the Garg committee submitted its report in July, 1987 the state cabinet had approved it only a few months ago. This included the list of chemicals allowed to be stored.

### No Responsibility

The Garg committee was appalled to find that there was no one to accept responsibility for the safety aspects of the grandiose chemical godown project. The promoters of the project said they would only build the godown and allot the premises to their members. The members were free to store whatever chemical they wanted, in any manner and in any quantity. Absence of a responsible agency for ensuring safety was the primary ground on which the Garg committee opposed the project.

Assuming that someone could be found for ensuring safety, when the committee asked if there was any mechanism to prevent storage of different chemicals in the same enclosure, there was no assurance. It transpired that even chemicals which would cause explosion and fire on mutual reaction would be stored in the same room. How would one ensure that the traders stored such reactive chemicals safely in separate places? The promoters of the project had no answer.

The project report did not envisage installation of any safety systems or equipment. Should any chemical drum leak, there was no specified procedure to handle the situation.

On top of it, the proposed godown is surrounded by residential units and the Garg committee asked the promoters how these inhabitants could be removed to safer zones. The answer was that they came much later than the project was envisaged and the government could be approached to shift them. But, the Garg committee did not find any satisfactory solution to protect human beings living near the site.

### Chemical List

Studying the list of hundreds of chemicals proposed to be stored, with no accompanying safety measures, the Garg committee disapproved the proposal. However, the members of the Antop Hill Warehousing Corporation, comprising industrial, and business personalities, sought the government's help in utilising the place. The corporation had already spent crores of rupees on the project. Then, the Garg committee was asked to give a list of what could be stored in the place.

A state government source said the ball was in the court of the Centre and the state government has kept the matter in cold storage. If the Bombay high court directed the state government to produce the Garg committee report, it would be furnished.

Mr. R. K. Garg, chairman and managing director of Indian Rare Earths Ltd., when contacted declined to give details of the report on the ground that it would be improper for him to do so. He, however, deplored the attitude of the state government in keeping the report confidential as it was a matter of public importance.

Courtesy: The Times of India

### 'PRICE WAR BY SMALL UNITS HITS DRUG EXPORTS'

The price war being waged by the small-scale drug manufacturers has affected the export of certain essential drugs, according to Dr. K. Shankaran, Director of Drugs in the Union Ministry of Chemicals.

Addressing the southern regional meeting of the Basic Chemicals, Phar-

maceuticals and Cosmetics Export Promotion Council (CHEMEXCIL) recently, he wanted the Council to use its good offices to stop the suicidal competition due to which certain drugs such as ibuprofen are being exported at much lower prices.

He called upon the small-scale manufacturers who export such drugs to form a cartel and prevent the fall in prices.

Dr. Shankaran noted that the situation today is ideal for increasing the export of chemicals and pharmaceuticals. This is because most of the international drug patents are due to lapse soon. Besides, the Food and Drug Administration of the US has identified 37 Indian drug units whose products have been found acceptable in that country.

He pointed out that the Government has selected chemicals and pharmaceuticals as major thrust areas for export promotion. Consequently, a 15-year action plan has been formulated and the Government will solve all the problems faced by the industry.

Mr. Ramu S. Deora, Chairman of CHEMEXCIL, said that the Council is hopeful of exceeding the target of Rs. 1000 crores in the current year as against the Rs. 783 crores achieved last year.

He thanked the Prime Minister, Mr. Rajiv Gandhi, for offering concessions in supply of raw materials and intermediates at international prices by the public sector units to boost exports.

He disclosed that the Council has forwarded action plans of about 250 member-firms for consideration of the Commerce Ministry. He urged the industry and trade to maintain the tempo so that the chemical sector achieves the export target of Rs. 5,000 crores set for 2000 A.D.

Coming to the performance of the South on the export front, the Chairman observed that though there has been an increase in the exports from the region, it has yet to catch up with the overall growth rate achieved by the Council as a whole.

At the same time, there has been an increase in the number of members from the South which stood at 393 as on date. Thus, there is tremendous potential for growth of exports from the region, Mr. Deora said, and asked the exporters to chalk out action plans in this regard.



## FOR YOUR IMPORTS

## AT COMPETITIVE CIF PRICE

Propylene Glycol BP/USP  
Tech  
Dimethyl Sulphoxide  
L-Lysine Mono HCl  
o-Nitro Benzaldehyde  
Propionyl Chloride  
Propiophenone  
Perchloroethylene  
Methylene Chloride  
Soya Lecithin  
Ethyl Bromide  
Cellosolve  
Pyridine Pure 2°  
Chloro Acetyl Chloride  
2,4-Dichloro Toluene  
o-Chloro Toluene  
Butyl Cellosolve

2,4-Dichloro Benzoic Acid  
Sodium Formate  
p-Chloro Toluene  
Succinic Acid  
n-Chloro Succinimide  
Dicumyl Peroxide  
Hydrogen Peroxide  
Isopropyl Alcohol  
Ethyl Acetate  
Tetra Butyl Ammonium  
Bromide  
2,3-Xylidine  
Iso-Octyl Thioglycolate  
Thioglycollic Acid  
Zinc Oxide  
Lactose BP/USP  
Trimethylol Propane

Please contact for further details :



**S. AMIT & CO.**

A TRUSTED NAME FOR IMPORT OF YOUR CHEMICALS

105, Neelam Centre, "A" Wing, Hind Cycle Road,  
Worli, Bombay-400 025.

Phones : 4934627-28/4933310

Cable : "DULICTOL"

Telex : 011-76877 CMIT IN

FAX NO. 22-4949504

Madras Office : Queens Court, 134, Montieth Road, Madras-600 008.

Phone : 860172/866942

Hyderabad Office: 8-3-215/7 (First Floor), Srinivasa Nagar Colony (West),  
HYDERABAD-500 890.

Phone : 35110

Our Associates : M/s. CHEM AMIT



(Contd. from p. 34)

no telltale wake of bubbles, because it uses magnesium silver chloride wet cell battery instead of compressed air for power. Seawater triggers the electrochemical charges of this battery just as distilled water triggers a car battery. The same cells provide independent power for ocean buoys which collect meteorological data and radio it back to the base station on the coast.

Dow Chemicals of the US is the single largest producer of magnesium today, followed by West Germany. Today a surprising 90 per cent of magnesium produced in the US comes from sea water. Magnesium ranks eighth in the order of metal production.

International Magnesium Association reports of two technologies that help brighten magnesium's long term assured future. The first involves selectively reinforcing stress point castings. These castings could combine the magnesium aluminium weight advantage with the stiffness characteristics of steel. Candidate auto parts include pistons, connecting rods, rocker arms, cylinder heads and engine blocks. The second technology involved the application of magnesium extrusions to high volume non-weather exposed auto parts. Extruded magnesium is currently being evaluated for structural applications by highway truck trailer manufacturers.

Because of the prevailing high prices of the metal in the international market, the Govt. of India have issued a letter of intent for a second Magnesium plant to be located in Orissa.

India's current requirement of this metal are being imported from Canada, West Germany, UK, USA and Norway.

Average human being carries about one ounce of magnesium, half of it in bone salts, the rest in individual cells where it activates various enzymes involved in producing chemical energy. A very small amount is circulated for external fluids and helping in nervous and muscular actions. Magnesium deficiency is the result of inadequate diet and can show up in

muscular tremors. Dairy and grain products, legumes, nuts and green vegetables all contribute useful amounts of magnesium in the diet. The presence of magnesium in hard water is well known.

On the average, fruits and vegetables contribute 1% of our daily intake of fat, 7% protein, 20% niocene, thiamine and iron and 25% magnesium.

The chlorophyll molecule has a ring structure and has a magnesium atom at the centre with a long Hydrocarbon Tail, called the phytyl group at one end. The phytyl group and the central atom are easily removed during cooking.

Of the magnesium ores magnesite refractories are of great importance in the metallurgy of steel and non ferrous metals, as they are used exclusively for that part of the furnace that comes into contact with the molten metal and Slag, a large tonnage being utilised in the bottoms and side banks of the open hearth furnaces.

Magnesite deposits are found in Salem district in Tamil Nadu, Mysore, Ajmer in Rajasthan, Pithoragarh and Almora districts of Uttar Pradesh and Singhbhum in Bihar. 97% of the magnesite marketed is consumed by the refractory producers catering to the ferrous and non ferrous industries.

Magnesite is marketed both in calcined and raw new forms on the basis of MgO content. Calcined magnesite is also used for special cement, Rubber and Magnesia boiler lagging compounds. Crude magnesite is consumed by epsom salt manufacturers. Inferior grade magnesite having higher silica content is consumed by mosaic flooring and tile manufacturers.

Although magnesium occurs in minor quantities in some soils, it does not appear to have any role as a micronutrient in agriculture.

— TPS RAJAN



## Nagarjuna fert. a drain on exchange ?

Is the Rs. 635-crore Nagarjuna fertiliser project in Kakinada, Andhra Pradesh, leading the country to a foreign exchange drain questions a news paper report.

The answer to this multi-million rupee question lies in whether the Government sanctions the import of certain equipment listed by the project authorities to be purchased under the International Competitive Bidding (ICB).

Information available from reliable sources indicate that as many as 113 items out of a total 219 have been listed for import under ICB, while the rest have been earmarked for local purchases. However the fact remains that as many as 86 of these 113 items meant for purchase abroad have already been supplied by Indian manufacturers to various end users in the past.

The industry sources fear that there is every likelihood of the equipment being cleared for purchase under ICB, thereby adversely affecting the domestic industry.

The sources feel that under ICB, the home manufacturers will be facing a number of hindrances that would render their prices uncompetitive. These are (i) different evaluation formulae for comparing offers received from indigenous bidders and overseas suppliers (ii) deemed export benefits under the World Bank formula will not be available to them in the case of ICB (iii) the evaluation formula will remain unknown at the time of making available tender documents to Indian bidders and (iv) the indigenous manufacturers will remain subjected to a 40-60 per cent duty on imported components in addition to excise duty and sales tax although the import of fertiliser equipment will be extended a 15 per cent duty concession.

In the case of such an eventuality, there is little doubt that the indigenous manufacturers will lose the competitive edge, the sources add. Furthermore the sources fear that the indigenous capacities will be rendered idle and underutilised resulting in considerable loss of financial and manpower investments.

Moreover, if import of these equipment is ultimately resorted to, not only will the domestic industry be seriously

jeopardised but also the outgo of foreign exchange will continue on a prolonged basis in the form of dependence on spares and replacements.

Already, most of the existing domestic units have subsisting collaborations with access to the latest technology and a considerable amount of foreign exchange is remitted every year for this purpose, the sources point out.

Because of these existing collaborations, the indigenous manufacturers have been able to supply equipment in the past to major fertiliser plants and other companies. The major plants to which equipment have been supplied are: Hindustan Fertiliser Corporation Limited (HFCL), National Fertilisers Limited (NFL), CFL, IFFCO, GNFC, GSFC, Kribhco, Indo-Gulf Fertilisers, Sri Ram Fertilisers, Mangalore Chemicals and Fertilisers, RCF, Neyveli Lignite Corporation, Oil and Natural Gas Commission (ONGC), Engineers India Limited (EIL), SCIC, FACT, Rourkela Steel Plant SAIL, IEL, TISCO, UPSCB, and MPEB.

## GLOBE ORGANICS TO PRODUCE NEW DRUG

Globe Organics Ltd., belonging to the Dr. Reddy's group of companies, plans to produce dextromethophan, a drug which is how the monopoly of two US multinationals.

Globe's ranitidine plant at Pedaduvulapalli (Nalgonda district) went on stream in June 1988. It is expected to produce 30 tonnes of ranitidine this year. Ranitidine is the latest in a series of H<sub>2</sub> antagonists, a billion dollar product with a growth rate of 25-30 per cent per annum. The company plans to step up production of this vital anti-ulcer drug to 100 tonnes to meet the increasing demand.

Cheminor, also belonging to Dr. Reddy's group, pioneered the production of ibuprofen in India, and is today the largest producer. It made 212 tonnes of this drug last year. More than 80 per cent of this drug is exported.

With the commissioning of naproxen and cephelexin plants, and the diversification of Cheminor, Dr. Reddy's group is poised to reach a turnover of Rs. 50 crores in 1989-90 and expects to earn more than Rs. 25 crores in foreign exchange from exports.

For Most Competitive CIF Offers For

**Pyridine 2 Deg. C**  
**Carbon Black 'HAF'**  
**Turpentine Oil**  
**And Other Chemicals**

Please Contact :

**M/s. K. SANGHVI & Co.**

308, 'Gulab', 3rd Floor, 237, P. D'Mello Road.  
BOMBAY-400 001.

Phone: Office: 268970/260711

Resi.: 8128473/8226451

Grams: 'KEYSANGHVI'

Telex : 11-73516 KSC IN



## FERTILISER PROJECTS :

**Marked progress in execution**

With a third HBJ gas-based fertiliser project expected to go on stream shortly, fertiliser project management seems to have registered major improvements.

The Indo-Gulf Fertilisers and Chemicals Project at Jagdishpur in UP will not only be ready on schedule, but also without any cost overrun. The Aonla unit of the Indian Fertiliser Co-operative Limited (IFFCO) was also ready in time early this year, as was the National Fertilisers Limited's Vijai-pur plant late last year. Both these projects were also commissioned at less than the initial project cost.

This is a major change from the history of fertiliser project in India — with cost and time overruns being routine in the 1970s and early 1980s. The average project gestation period has been reduced from between 48 and 60 months to 36 months. It is being further reduced to 30 months in the second stream of Aonla.

Experts in the fertiliser industry attribute this change to several factors: better project management, closer monitoring of schedules, the use of proven technology and free access to foreign exchange.

A quick analysis of some of the major fertiliser project that were delayed in the past reveals that bilateral financing, tied aid and unproven technology were the main factors responsible for time and cost overruns. There was a mismatch of technologies and equipment. This was the time when the country was experiencing a foreign exchange crunch and equipment orders were placed with countries that offered aid.

The coal-based plants at Ramagundam and Talcher were planned when the coal-based fertiliser technology was in its infancy. At that time only one coal-based fertiliser plant was in operation in the world, in South Africa

and India could not seek its help. The result was a four-year delay in commissioning the plants and costs registered an almost a 100 per cent increase.

The Sindri rationalisation plant was based on Bulgarian technology, tied to the use of Bulgarian aid. This was also behind schedule by almost four years and had a more than 100 per cent cost overrun. The plant never operated at more than 20 per cent of its capacity and had to be ultimately closed.

Durgapur and FACT Cochin I are also the victims of bilateral credit and unproven technologies. Haldia should have been commissioned in December 1976 and is yet to start production. It has a record 19 bilateral credits to its credit.

As against this, the projects financed by the World Bank and those having free access to foreign exchange were completed in 36 months. Hazira, Vijai-pur and Aonla were also ready for commissioning within three years of the zero date.

## Technological Excellence and Quality of our Centrifuges Wins us the Prestigious Award

With  
**INTERNATIONAL  
TROPHY FOR  
TECHNOLOGY**  
Frankfurt-W. Germany

Manufacturers of  
**Highly Reliable Centrifuges  
for Liquid & Solid Separation**



**HYDROCHEM ENGINEERS**

Associate Concern of:

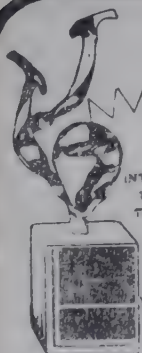
**TEXTILE ART MACHINERY**

145, Adarsh Industrial Estate, Sahar Road,

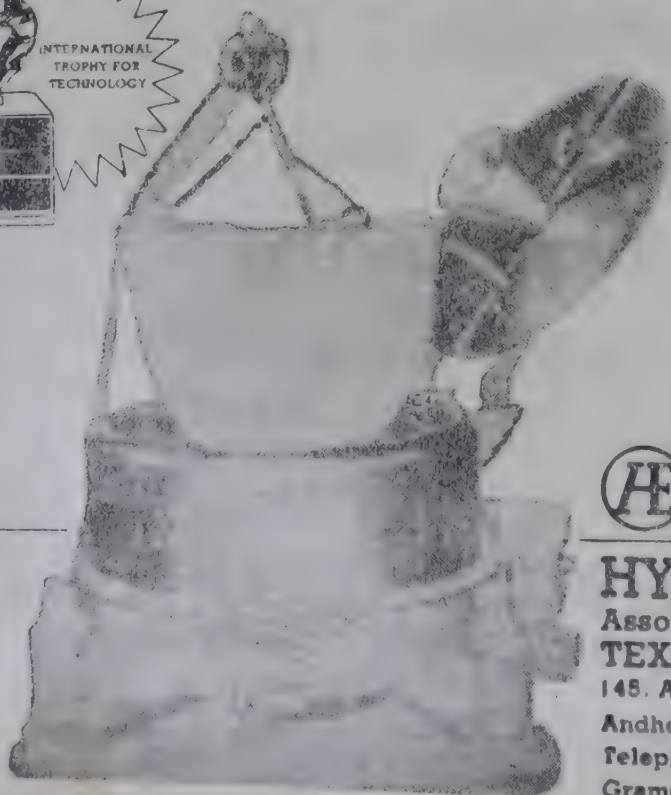
Andheri (E), Bombay 400 099.

Telephone: 832 2721-832 5957 • Telex: 011-71933 TAM IN

Grams: 'TAMHYDRO' Andheri, Bombay.



INTERNATIONAL  
TROPHY FOR  
TECHNOLOGY





The World Bank-financed projects or those having free access to foreign exchange were free to select proven technologies. IEL has the ICI technology. DCF Thal, Hazira, Vijapur, Aonla and Jagdishpur have Haldor Topsoe and Snam/Kellogg technologies.

International competitive bidding also ensured the supply of the right equipment to these plants at competitive prices and in time.

With the passage of time, the Indian consultants have also gained experience and move from an era of ad hoc planning to the latest techniques of management. Experience has also made the consultants cut down on time required for detailed engineering. Earlier this task used to take at least 18 months. Now it takes six months less.

Moreover, since most of the recent fertiliser plants are gas-based, these require much less equipment than those run on Naphtha, fuel oil or coal.

An expediting team has become absolutely essential for all the fertiliser projects. Earlier, the promoters used to leave the entire job of expediting the project to the consultants. Now, besides the promoters taking a direct interest in the early completion of the project, also insist on the consultants forming the expediting teams for the timely procurement of equipment and completion of the project.

Industry sources say that a competent expediting team can save six to eight months of completion time. Indo-Gulf Fertilisers had a six member expediting team.

Immediately after finalising the project plans, orders are placed for the supply of equipment. It has been increasingly realised that every year of delay results in a 10 per cent cost overrun.

In earlier projects, design and procurement used to be the responsibility of the consultant and the promoter used to get the civil work done at the site himself. This used to result in the equipment reaching the site and the civil work not completed or vice-versa.

This trend changed in 1978-79 when the single-point responsibility came into existence. Sources say that this was another major factor that helped in cutting down drastically on time and cost overruns.

## INDIAN STANDARDS RELATING TO PETROLEUM, COAL AND RELATED PRODUCTS

The Bureau of Indian Standards has published the following new and revised Indian Standards relating to the field of Petroleum, Coal and Related Products:

IS:446-1987 — Rubber air hose (fourth revision)

IS:517-1986 — Methanol (methyl alcohol) (second revision)

IS:1012-1987 — Turbine lubricating oils (second revision)

IS:1088-1987 — Lubricants for clock like mechanism and precision instruments (second revision)

IS:3400 (Part 1)-1987 — Methods of test for vulcanized rubbers: Part 1 Tensile stress-strain properties (second revision); (Part 4) — Accelerated ageing (second revision)

IS:9316 (Part 2)-1987 — Methods of test for rubber latex: Part 2 Determination of viscosity (RL:2) (first revision); (Part 7) — Determination of total copper (RL:7)

Copies of these Indian Standards are available from the Sales Services at BIS Headquarters at New Delhi and Regional and Branch Offices located at Bombay, Calcutta, Chandigarh, Madras, Ahmedabad, Bangalore, Bhopal, Bhubaneswar, Guwanati, Hyderabad, Jaipur, Kanpur, Patna and Trivandrum.

## NOCIL HIKES MEG PRICE

The National Organic Chemicals Industries Limited (NOCIL) has hiked ex-factory selling price of MEG (mono ethylene glycol) by Rs. 1,500 per tonne today. It is learnt.

NOCIL's new selling price is Rs. 18,850 per tonne against Rs. 17,350 prevailing since the beginning of the current year.

The Indian Petrochemicals Corporation Limited (IPCL), the only other MEG producer in the country, had raised its selling price from Rs. 17,400 per tonne to Rs. 18,500 from August 4, 1988.

MEG is one of the major raw materials for polyester industry. Its availability from indigenous sources have come down considerably and even supply from international markets is erratic.

We Offer Yearly Contract For :

**PIPERAZINE HYDRATE I.P.  
PIPERAZINE CITRATE I.P.  
PIPERAZINE PHOSPHATE I.P.**

Also Available Ready Stock :

**IODINE I.P.  
CHLORAMPHENICOL I.P.  
SULFACETAMIDE SOD. I.P.**

Manufacturers :

**ISHITA PHARMACEUTICALS**

P. Box 12001, PALDI,  
AHMEDABAD-380 007.

Phones : 78560/78218.

Telex : 121-7158 ISHT IN





## SHAHJAHANPUR FERTILISER PROJECT :

**NRI, Oswal Agro main contenders**

A non-resident Indian and the Oswal Agro group are emerging as the main contenders for the Shahjahanpur gas-based fertiliser project.

Most of the public and co-operative sector fertiliser companies are also in the run for the project, the letter of intent for which was held till recently by the Caparo group of Mr. Swraj Paul.

The non-resident Indian this time is one Dr. B.K. Pande who is a leading heart specialist in the USA. He is executive vice-president of the US-based Shakti International Resources Incorporated.

Dr. Pande reportedly met Prime Minister Rajiv Gandhi in New York during his visit there, and showed interest in taking up the project. The Prime Minister reportedly advised Dr. Pande to write to the concerned ministry regarding it.

In his application for the letter of intent, Dr Pande has offered to meet

the entire foreign exchange requirement of the project. He has also offered to arrange all the funds required for his share of the equity.

In its application for the letter of intent, the Oswal Agro group has said that it wants to diversify into production of urea fertilisers.

The existing range of the group's activities include manufacture of industrial hard oil, vegetable ghee, refined oil, sugar, toilet soap, distilled battery acids, glycerine, oxygen, rice, chemicals and power generation (from agro waste).

It has joined hands with the Punjab State Industrial Development Corporation for implementing the Rs. 62-crore 100 per cent export-oriented unit — Oswal Agro Furan Limited — for the manufacture of furfural and edible rice bran oil. The project consists of rice milling with 120 tph capacity — the largest in the world.

The group says it has substantial financial strength. Its annual turnover for 1987 was Rs. 200 crores, and is projected to exceed Rs. 300 crores in 1988 and Rs. 500 crores in 1989.

Based on the current market price, the net worth of the group companies stands at Rs. 300 crores.

According to the application, the group companies have surplus funds to the extent of Rs. 100 crores which can be gainfully utilised in the project. The group will be willing to invest its further annual accruals for the purpose.

It says that the group enjoys excellent rapport with and confidence of its shareholders numbering 2.5 lakhs, and is confident of raising further resources from its shareholders.

The group says that it is interested in setting up a 2,500 tpd urea fertiliser plant. The funds required can be met from surpluses available with it, internal accruals and shareholders. It has asserted that "all funds required shall be met from our own resources without involvement of any loans from any financial institutions."

FOR YOUR REQUIREMENTS OF :

# Antimony Trioxide

[Sb<sub>2</sub>O<sub>3</sub>]

Contact

## Maheshwar Rang Rasayan

1/3, Issaji Street,  
Purushottam Bhuvan,  
Vadgadi

BOMBAY-400 003.

Tele : 323704, 328139

### TITANIUM NITRIDE COATING SAVES JET MONEY

Significant savings in overhaul time and in the scrap rate of expensive components are being made at the multi-million pound Joint European Torus (JET) fusion project as a result of using titanium nitride coating technology developed by the Tecvac company from Cambridge in eastern England.

In the past, up to 30 per cent of expensive alloy fasteners were scrapped because they "picked up", or cold welded, and jammed. They had to be drilled out laboriously and expensively. Now, following the introduction of titanium nitride coating to these fasteners, the scrap rate has been reduced to just one per cent.

Tecvac says that the same coating technique could also benefit other nuclear systems and high level engineering systems such as gas turbines and power generating equipment.

The JET laboratory near London is one of the leading co-operative European research centres. It was set up in 1978 to design, build and operate the latest nuclear fusion experimental machine, the precursor of fusion reac-



ors for generating electricity without reliance on fossil fuels.

In the heart of the system is one of the world's largest ultra-high vacuum systems, capable of operating at high temperatures and ultra high vacuum continuously for periods of up to 12 months between maintenance periods. Temperatures as high as 100 million degrees centigrade are being sought and the overall aim is to create nuclear fusion as a source of energy in the same way that it is generated in the sun and the stars.

The alloy fasteners now treated by titanium nitride are used to hold graphite tiles in places within the fusion chamber, where the fusion process is held within a magnetic "cage". Because of the arduous conditions, all fasteners have to be made in heat resistant alloys or other performance materials which are notorious for their ability to "pick up" or cold weld. Previously, other coatings such as gold and silver plating were tried, but they were expensive and only provided a partial answer.

The application of titanium nitride coating by Tecvac's PVD process has solved the problem. The coating has low co-efficient of friction, chemical inertness and an insignificant effect on the very close screw tolerances required of the fasteners. Tecvac has just completed a batch of 20,000 fasteners for the JET laboratory, having processed a similar quantity last year.

Now, the laboratory managers can confidently predict the time for maintenance periods, knowing that virtually all the fasteners will easily undo, thus allowing the maintenance period to proceed unhindered.

Further applications for the coating are envisaged by Tecvac in large and highly stressed machines that have to use high strength fasteners under difficult conditions — such as aircraft and naval gas turbines, and electricity generating turbines. Further information from Tecvac Ltd, Stow cum Quy, Cambridge, England CB5 9AB.

#### IMPORT POLICY CHANGES HIT FORMIC ACID UNITS

Manufacturers of formic acid have alleged that large quantities of duty-free material imported under the advance licensing scheme are being released in the open market at cheap

prices, causing serious marketing problems.

The three manufacturers of formic acid — Periyar Chemicals Ltd., Kerala Acids and Chemicals Ltd. and Southern Formates Ltd. have a combined installed capacity of 3,700 tonnes.

All the three have reported large inventories. A fourth unit with a capacity of 5000 tpa is scheduled to begin production later this year. Formic acid is used in leather chemicals.

Manufacturers have complained that recent modifications in import policies have adversely affected them. These include raising of the Rep entitlement of formic acid for finished leather exports from 1.5 per cent to five per cent by the December 1986 notification. The earlier entitlement of 1.5 per cent was fixed after a detailed study by BICP and did not warrant change they feel.

This liberalisation has resulted in the import of several hundreds of tonnes of formic acid by the trade. What has alarmed the indigenous units is that as per the 1983-89 policy, the Rep entitlement has been further increased to "an alarming 15 per cent". With leather exports projected at Rs. 1,000 cro-

res per annum, import of formic acid will exceed 12,000 tonnes against the country's total requirement of about 4,000 tonnes, according to the manufacturers.

They have requested the Government to effect the following changes: restoration of Rep entitlement to 1.5 per cent, withdrawal of the facility to import formic acid under the advance licensing scheme and increasing the basic import duty from 100 per cent to 150 per cent.

#### NALCO RECORD

The public sector National Aluminium Company (NALCO) has set a record by exporting a single consignment of 26113 tonnes of alumina from its captive port facilities at Visakhapatnam.

Valued at Rs. 15 crores, the shipment was despatched on August 14 to the US through Pechiney Trading.

With this, NALCO has completed exports of nearly two lakh tonnes since January 1988. During the period, the company has earned foreign exchange worth Rs. 50 crores from alumina exports. It hopes to touch the figure of Rs. 100 crores by the end of the financial year.

Please write to us for your requirements in :

### *Sodium Bi Sulphite*

(Pure & Technical)

### *Sodium Meta Bi Sulphite*

(Pure & Photographic)

Regd. Office & Factory :

**Datta Chemicals (P) Ltd.**

D-24, Sardar Estate, Ajwa Road,  
BARODA-390 019.

Phone: F. 540473/541243 R. 321447

Our Bombay Agent :

**M/s. RAJENDRA CHEMICAL CO.**

517, Anant Deep Chambers,  
273/77, Narshi Natha Street,  
BOMBAY-400 009.

Phone : Office: 8550570/8559670

Resi. : 6053034



## POLYSILICON PRODUCTION:

**Hemlock knowhow to be used indigenously**

The Centre has made it clear that the cancellation charges and other fees worth Rs. 7.92/crores which was paid to Hemlock Semi-conductor Corporation of the US for polysilicon technology will not go waste.

In reply to a question in the Lok Sabha, the Minister of State for Science and Technology and the Department of Electronics, Mr. K. R. Narayanan, said the technical knowhow, process design, standard operating procedures and material requisition documents that India received from Hemlock for the production of polysilicon would be indigenously used for the development of technology, especially electronic grade.

Although the application areas have not yet been worked out and discussions are still on at the highest level, official sources said the Hemlock technology in all probability, would be optimally utilised in the advanced sectors like space and defence purposes.

The country had entered into a deal with Hemlock in 1985 for the development of polysilicon technology along with know-how transfer.

However this led to a long-drawn controversy as certain officials had failed to assess the indigenous technological developments.

Metkem silicon of Mettur Chemicals had done pioneering work in the field and the technology and product was found to match world standards. The deal with Hemlock was finally cancelled in 1987 to give a pep to domestic know-how at a fractional cost.

However, the Metkem technology is suitable for solar-grade polysilicon which finds applications in photovoltaic cells.

Metkem has a capacity to produce 25 tonnes of polysilicon at present. Another two companies are producing about 15 tonnes. One tonne of polysilicon yields 50,000 of silicon wafers, the final product.

Efforts are on to increase the production capacity by pumping in more investment to meet the domestic demand.

**MCA PROJECT:  
SC RULES IN FAVOUR OF MODIS**

The Supreme Court has turned down the plea of monochloro acetic acid (MCA) manufacturers that the Modis be restrained from implementing their Rs. 180-lakh MCA project at Alwar in Rajasthan.

Eight MCA manufacturers had objected to the proposal of Modi Alkalies and Chemicals Ltd. to set up a 2,000 tpa plant. Their objections had earlier been turned down by the Monopolies and Restrictive Trade Practices Commission (MRTPC). The Supreme Court, upheld the MRTPC ruling.

The MCA manufacturers objected to the proposal on the ground that a large house like the Modis ought not to enter this field where medium-size and small-scale units are already struggling to sell the product because of stagnant demand. The bulk of MCA is captively consumed, and trading is only in the region of 2,500-3,000 tonnes, according to industry sources.

The existing units together have around 10,000 tonnes of installed capacity. There are four manufacturers in the organised sector and six small-scale units, out of which three are under the sick list and are beneficiaries of Government's nursing schemes. The creation of fresh capacity, therefore, is unjustified, they told the court. Another objection was that the Modis were going in for foreign technology.

The Modis argued that demand for MCA is bound to increase because of the growth in the consumption of MCA-based weedicides, pesticides and other chemicals. Also, MCA had export potential. It attributed the under-utilisation of existing capacity to "inadequate technology."

The company will reportedly pay Rs. 2 crores for purchase of foreign technology. The Regional Research Laboratory of Hyderabad had expressed its inability to provide the technology sought by the Modis and hence the decision to go in for collaboration.

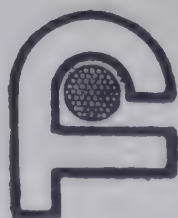
**FILTER CLOTHS****In Polypropylene, Polyester  
Nylon and Cotton**

**ALSO MANUFACTURERS AS PER YOUR SPECIFICATION**

**Readymade Filter Bags, Centrifuge Bag, Filter Press Pieces**

**Notch Filter Bags are Fabricated as per your Drawings  
at MOST COMPETITIVE PRICE**

Free Technical Service From :



**Filtron**

Gaya Bldg., Office No. 50, 4th Floor,  
109, Yusuf Mehrali Road, BOMBAY-400 003.

Phone : 341209 Resi. : 6122526

Factory : Bombay-400 010.



# NEWS IN BRIEF

## NOCIL CLARIFIES ON ALLEGED TAX EVASION

National Organic Chemical Industries (NOCIL) has in the wake of press reports alleging excise duty evasion by the company clarified in a statement that it has an obligation to supply ethylene to Polyolefin Industries Ltd. (PIL), its sister concern, under an agreement and these supplies are made at the contracted price. It has been filing its price list with the excise authorities. The agreement incorporates also the price escalation factor.

NOCIL has further clarified that PIL is a bulk customer and has made large investments depending on ethylene supplies from NOCIL. The marginally higher price negotiated with other customers like Polychem is mainly due to the small volume of their offtake and mode of delivery, the statement says. NOCIL further says it has not evaded excise duty since it recovers whatever duty it pays to the government from PIL which in turn gets corresponding godvat credit.

## SC ISSUES NOTICE TO UNION CARBIDE

The Supreme Court issued notices to the Union Carbide India and its parent organisation in the USA — the Union Carbide Corporation — on a miscellaneous civil petition seeking a direction to them to disclose all information in their possession accumulated during more than 20 years of research on the effect of MIC gas.

The court also issued notice to the Madhya Pradesh government on a prayer in the petition seeking continuation of supply of ration including milk and sugar to the gas victims which was reportedly stopped after 13 months of the 1984 tragedy.

The notices were issued by a division bench comprising chief justice R. S. Pathak, Mr. Justice M. H. Kania and Mr. Justice L. M. Sharma after preliminary argument on the petition.

The petition is an offshoot of a writ petition filed by Dr. Nishit Vohra seeking a direction to the Madhya Pradesh government to provide correct line of treatment to the gas victims and rehabilitate them by providing jobs according to their health status.

The court granted four weeks time to the Union Carbide India and the Union Carbide Corporation of the US to file their replies.

Similarly the Madhya Pradesh government was allowed two weeks to file its reply.

## IS STANDARDS: HDPE WOVEN SACKS FOR PACKING FLOUR

Bureau of Indian Standards has brought out an Indian Standard Specification for High Density Polyethylene (HDPE) Woven Sacks for Packing Flour (IS: 12100-1987). It prescribes requirements of two types of HDPE Woven Sacks. Type 1 will be suitable for packing flour in the nominal capacity of 20 kg and 50 kg and Type 2 for packing in the nominal capacity of 5 kg and 10 kg.

There is extensive use of HDPE Woven Sacks for packing flour within the country. It is expected that with the use of the bags conforming to this specification, the wastage of flour during various stages of handling would be prevented considerably.

## NOTED BIOCHEMIST DEAD

The internationally-known biochemist, Prof. L. K. Ramachandran, died in Hyderabad recently after a brief illness.

He was the former head of the biochemistry department of Osmania University. He was 60.

REPLACE traditional Sequestering agents like EDTA, NTA, STPP, SHMP etc. with improved performance and at a considerable cost reduction with:

# 'SEQUACEL'

SEQUESTERING AGENT

(Hydroxy Ethylenedene Diphosphonic Acid)

Manufactured by :

## EXCEL INDUSTRIES LIMITED

Contact Agent :

## Sunlit Distributors

504, Vyapar Bhavan,

P. D'Mello Road,

BOMBAY-400 009.

Tele : 323704, 328139



## AVAILABLE REGULARLY

TRI ETHYL AMINE  
 DI ETHYL AMINE  
 D.E.G. \* M.E.G.  
 ACETONITRILE \* CARBITOL  
 ETHYL CELLOSOLVE  
 BUTYL CELLOSOLVE  
 MIXED XYLENE ORTHO XYLENE  
 HYDROGEN PEROXIDE 50%  
 GLYOXAL 40% \* E.D.C.  
 PYRIDINE 2° (Original)

OXALIC ACID 98% & 92%  
 OXALIC ACID (Substitute)  
 TARTARIC ACID (Substitute)  
 PHTHALIC ANHYDRIDE  
 PARA FORMALDEHYDE 91%  
 TRICHLORO ETHYLENE (Tech.)  
 METHYLENE CHLORIDE 99%  
 I.P.A. (Original & Distilled)  
 ACETONE (Original & Distilled)  
 THIONYL CHLORIDE

Kindly Contact :

## BEEKAY ENTERPRISES

M-1 Faiz-E-Qutbi, 375, Narsinatha Street, P.O. Box No. 5212,  
 BOMBAY-400 009.

Phone : Office : 349080, 345011, 322958, 348475

Resi. : 5121572, 5124452

Please Contact For Your Requirement Of :

# Carbon Tetrachloride

## M. M. INDUSTRIES

432, Arun Chambers,  
 Tardeo Main Road  
 Bombay-400 034.

Phones : 493 83 95  
 494 96 55  
 494 96 56

\* Authorised Dealer of M/s. NATIONAL RAYON CORPORATION LTD. \*

FOR YOUR REQUIREMENTS OF :

PURE/RECOVERED

Acetone/IPA/Methanol/Toluene/Benzene /Xylene/NBA/EDC/ Crude/  
 MDC/MEK/Hexane/Acetic Acid (Glacial) /Octanol (170°C-180°C)  
 Butyl Stearate/ISO-amyl alcohol (128°C-132°C)

We are also interested in purchase of all kinds of chemical waste/crude  
 material in bulk

Please Contact :

## VIPRA CHEMICALS

F/20, AMBEKAR NAGAR,  
 PAREL, BOMBAY-400 012.



## a rapid wrap-up of what's new in operations, processes & products

### Laser Technology in Chemistry

A recent issue of *Applied Physics* (1988, B46, No.3, July, p.197-282) gives highlights of remarkable developments in laser technology with reference to its impact on chemistry. Laser spectroscopic techniques provide new means for a detailed understanding of chemical reactions. New diagnostic techniques allow combustion reactions to be studied. Laser-induced reactions have some unique features and isotope separation is practical. The isomerization of carvone to carvone camphor may be cited as an example.

IR laser spectroscopy allows in situ monitoring of ammonia in power plants for combating nitric oxide. The model indicates that rapid mixing of  $\text{NH}_3$  with flue gases is essential to obtain optimal reduction results. The application of planar laser induced fluorescence gives access to a study of turbulence in reactors. Lasers have also been used in genetic engineering.

The laser isotope separation is receiving increasing attention; an early example was  $10\text{ BCl}_3$  and  $11\text{ BCl}_3$ . Carbon isotope separation has been realised. UV laser ablation of polymers may prove to be technologically beneficial. Laser induced reactions at or near surfaces can carry out ingenious modifications of surfaces.

### Loop Reactors (LR)

Dierendonck *et al.* have discussed scale-up aspects of LR, which are very useful for conducting a variety of gas-liquid reactions, such as, hydrogenation, chlorination, ethoxylation, etc. Heat transfer problems can be handled easily as the heat exchanger is external to the reactor whose key feature is a well designed venturi. The scale-up is based on a constant power input per unit venturi volume, while the pump capacity is derived from the rule of a constant recirculation time. LR can offer  $k_L a$  values as high as  $1\text{ sec}^{-1}$  and are particularly good for fast reactions operated under pressure. (Paper presented at the 6th European Conference on Mixing, May, 1988, Pavia, Italy; *Proceedings*, p. 287).

### A new strategy in extractive distillation

A new solvent, based on the use of aqueous solution of hydrotropes, has been proposed which allows good values of relative volatility to be realised with such close-boiling mixtures as 2,6 xlenol-p-cresol. For acidic mixtures solutions of alkanolamines also act as good solvents (*Sep. Sci. Technol.*, 1988, 23, 429-436).

### Asymmetric halogenation (AH) and hydrohalogenation of styrene

Sakubara and Ishizaki have studied AH of styrene in microcrystalline cyclodextrin complexes (CDC), both in gas-solid and in aqueous or dimethyl sulfoxide systems. In the case of the gas-solid brominations in the alpha- and beta-CDC (-) -1,2 dibromo-1-phenyl ethane was predominantly produced; the alpha variety gave chiral induction 9 times that of the beta variety. By contrast, brominations in the homogeneous medium containing both alpha- and beta CDC's gave no dibromide but racemic bromohydrin (*J. Inclusion Phenomena*, 1987, 5, 449).

### Stereospecific epoxidation by air of cholest-5-ene (CE) derivatives

Marchon and Ramasseul have shown that a Ru porphyrin catalyst catalyses the epoxidation by air of several CE derivatives in high yield and with nearly complete B-stereo-specificity (*J.C.S.Chem. Commun.*, 1988, 298).

### Ru catalyst for cycloolefin preparation

Sumitomo Chem. Ind. have claimed that partial hydrogenation of aromatic hydrocarbon can be performed with Ru and P oxoacid salts. (Jap. Patent. Appl. 62/142, 126, *Cf Platinum Metals Rev.*, 1988, 32, 103).

### Oxidation of ammonia to nitric oxide—a new thin layer lattice catalyst

A USSR patent claims that a twin layer lattice catalyst, where lattice-1 contains Pt, Rh and optimally Pd, Ru; and lattice-2 contains Pd, Au, and option-



ally Pt, Rh, Ir, Co and/ or Ag, requires less Pt and at the same time the loss of the noble metal (i.e. Pt) is reduced by 65% with hardly any effect on  $\text{NH}_3$  conversion (Platinum Metals Rev., 1988, 32, 104).

### Sorbitol using Ru hydrogenation catalyst

Pfizer have claimed that a two-stage hydrogenation of hydrolysed starch gives complete conversion. Here for the first stage, after acidification, Ru catalyst is used at 100-180°C and 35-140 atm. (U.S.P. 4, 694, 113).

### Synthetic methods and reactions

Surya Prakash and Olah have given an excellent account of the development of a series of reagents and reactions for organic synthesis based on simple raw materials. The use of nitronium and nitrosonium salts and related reagents as nitrating agents, pyridinium polyhydrogen fluorides as a halogenating agent, solid superacid catalysts for Friedel-Crafts reactions, oninium ion and carbocation salt reagents, etc. is discussed. (*Proc. Indian Acad. Sci. (Chem. Sci.)*, 1988, 100, 143).

### Liquid phase methanol process

Air Products have put up a pilot plant of 5 tpd capacity where a mineral oil is used with a commercial copper powder catalyst where the product  $\text{CH}_3\text{OH}$  comes out as vapour. The specific advantage of the liquid phase is that it can operate with  $\text{H}_2$ : CO ratio of 0.7:1, unlike the vapour phase process which requires the ratio of 2:1; such a lean gas comes from coal gasification processes. (*Chem. Eng.*, 1988, 95, No.9 (20 June), p. 27).

### Homogeneous catalysis for agrochemicals, flavors and fragrances

Parshall and Nugent (of Du Pont, U.S.A.) have given a fascinating account of this subject with practically relevant examples. Pyrethroid insecticides — Permethrin — relatively high *cis*- and *trans* ratios are found with dimeric rhodium (II) carboxylate catalysts like those used in the thienamycin synthesis. Some permethric acid derivatives have optical as well as geometric isomers. A lot of work on asymmetric cyclo-propanation catalyst has been done. Pyrethroids based on chrysanthemic acid esters are most active in the naturally occurring *D-trans* form. Homogenous catalysts have been suggested for the

reaction between  $\text{CCl}_4$  and  $\text{CH}_2 = \text{CHCOCl}$  ( $\text{CuCl}$  in acetonitrile medium at 115°C).

Aluminium trianilide is used as a catalyst for ortho ethylation of aniline.

Phenylalanine production has started in Europe by an asymmetric hydrogenation process analogous to the Monsanto process for L-dopa. (*Chemtech.*, 1988, June, 376-383).

### $\text{H}_2$ $\text{O}_2$ : Technology and business

A recent issue of Chemical Engineering (1988, 95, No.9, 20 June, p.32-37) gives an up-to-date account of contemporary developments in technology and new markets. The recent Du Pont process for the direct reaction between  $\text{H}_2$  and  $\text{O}_2$  in an aqueous acidic medium containing Pd/C catalysts appears to be most attractive. Dow and Occidental have an electrolytic process, using a membrane cell, where  $\text{H}_2\text{O}_2$  is produced in an alkaline medium; the efficiency of  $\text{O}_2$  reduction at cathode is 80-99%.

The use of  $\text{H}_2\text{O}_2$  is growing rapidly in bleaching of pulp as the process is free from pollution. New applications for environmental protection are: in-situ treatment of contaminated soils, detoxification of cyanide wastes, etc.

### Cyclohexanone oxime (CHO) from cyclohexanone (CH), $\text{NH}_3$ , $\text{H}_2\text{O}_2$

Montedipe's research has developed a new process where a highly selective catalyst allows reaction between CH,  $\text{NH}_3$  and  $\text{H}_2\text{O}_2$  to give CHO. Thus the Co-production of ammonium sulphate can be drastically out. (*ECN*, 1988, 4, July, p. 17).

### Bioconversions of lipophilic substances by encapsulated enzymes (EE)

Biocatalysts (enzymes; microbial cells) have been made resistant to organic solvents through different approaches: chemical, biochemical and genetic. Immobilization of biocatalyst on or in suitable supports appears to be very promising. S.Fukuis group has developed convenient methods for entrapping biocatalysts inside gel matrices formed from synthetic pre-polymers. *Nocardia rhodocrous* (cells) have been used in benzene (in heptane)-water system for dehydrogenation of ADD and TS. Stereoselective hydrolysis of *dl*-menthyl ester has



been carried out in heptane - water with *Rhototula minuta* (cells), Stereo selective esterification of *dl*-menthol has been carried out with lipase in cyclohexane-water system. (*J. Am. Oil Chem. Soc.*, 1988, 65, No.1, 96-100).

### Homogeneous Catalyst for $\text{CO}_2$ $\text{H}_2$ , $(\text{CH}_3)_2\text{NH}$ reaction to DMF

Schreiner et al., have shown that  $\text{Pt}_2(\text{u dpmm})_3$  ( $\text{dpmm} = \text{Ph}_2\text{PCH}_2\text{PPh}_2$ ) catalyses under unprecedented mild conditions, in a reversible way, the reaction under reference. (*J.C.S. Chem. Commun.*, 1988, p. 602).

### Reaction between Phenol and HCHO: Selectivity through cyclodextrins

M. Komiyama has reported a highly selective synthesis of 4hydroxy-methyl phenol with modified cyclodextrins having hydroxypropyl residues. Para to ortho isomer ratio of 15.7 has been realised. (*J.C.S. Chem. Commun.*, 1988, 651-652).

### Enzymatic oxidation of cholesterol aggregates in supercritical ( $\text{SC}$ ) $\text{CO}_2$

Blanch, Prausnitz and co-workers have already reported the use of  $\text{SC CO}_2$  in conducting enzymatic reactions. Cholesterol oxidase has been found to be active in  $\text{SC CO}_2$  and  $\text{SC CO}_2$ -co-solvent mixtures. Variations in solvent power caused by pressure changes or by the addition of dopants affected the rate of enzymatic oxidation of cholesterol by altering the structure of cholesterol aggregates. (*Science*, 1988, 239, 22 Jan., 387).

### Catalytic hydrogenation of triglycerides

It has been claimed that catalysts, containing Cu, Cr, Ba, etc., give on hydrogenation of triglycerides (e.g. coconut oil) high yields of fatty alcohols and 1,2 propanediol. (Ger. Offen. 3,624,812, 1988, *Cf. Chem. Abstr.*, 1988, 108, 223438).

### Handling of Corrosive Chemicals

#### Plate Heat Exchangers

Alfa-Laval have introduced a new design of PHE where gaskets, which may not be able to withstand highly corrosive and aggressive materials, are replaced by welded construction. Albright and Wilson have used such a construction for an exo-

thermic reaction and this has allowed the batch time to be halved. Hastelloy C276 plates were laser-welded. (*Processing*, 1988, April, p. 13).

### Flue Gas Desulphurization (FGD)

BASF in W. Germany have an FGD unit based on the Wellman-Lord process which uses a GRP contactor, 9.4 m dia. and 35.5m high. Here aqueous sodium sulphite is used as an absorbent; pure  $\text{SO}_2$  is obtained as the product. A vinyl ester (of BASF make — PALATAL A 430) is used.

Du Pont fluoroelastomers are also very useful for lining of steel. (*Processing*, 1988, April, p.30).

### Plastic Heat Exchangers (PLHE)

At Elektromark AG power plant in Hagen, West Germany, a PLHE — made of PTFE, PVDF and perfluoroalkoxy co-polymer, has been found to be absolutely corrosion resistant in an FGD plant. Due to antistick quality of polymer, the fly ash build-up is about 10% of that in a metal HE. (*Chem. Eng.*, 1988, 95, No.5, May, pp. 17-23).

### Ion Exchange Resin (IER) catalysed reactions

#### Decomposition of tert amyl methyl ether (TAME)

Erdolchemie have claimed that  $\text{SiO}_2$  — modified Lewatit SPC 118 strongly acidic IER allows TAME, with water, to be decomposed to methanol and iso-amylene (2-methyl-1- and 2-methyl-2-butene) at 363 K at high levels of conversion and yield (Ger. Offen. 3,610,704, Oct. 1987, *Cf. Chem. Abstr.*, 1988, 108, 186161).

#### Tetraisobutylene (TIB) from diisobutylene (DIB)

Erdoochemie have claimed that a macroporous cationic IER with zeolites of 3A allows DIB to be converted to TIB. (Ger. Offen. 3,612,443, Oct. 1987, *Cf. Chem. Abstr.*, 1988, 108, 186162).

#### Hydroformylation (oxo/reaction) of vinyl chloride (VC)

Mitsui Toatsu have claimed that VC, with CO and  $\text{H}_2$ , gives  $\text{MeCHClCHO}$  with rhodium phosphine ligand at 55 Degree and 85 atm pressure. The oxidation of chloroaldehyde gives the corresponding acid which in turn on hydrolysis gives lactic acid



(J.P. 62, 273, 935, Nov. 1987, *Cf. Chem. Abstr.*, 1988, 108, 186169).

### **Oxidation of organic compounds with hydroperoxides**

Muller and Idmoumaz have shown that  $\text{RhCl}(\text{PPh}_3)_3$  and  $\text{Rh}^+$  (diphos) catalyse oxidations with tert butyl hydroperoxide. Thus anthracene is converted to anthraquinone; 1-phenyl ethanol to acetophenone etc. It is interesting that terminal olefins are converted to the corresponding ketones but the internal olefins are unreactive (*J. Organometallic Chem.*, 1988, 345, 187).

### **Oxidation of unsaturated fatty acids (UFA)**

Zaldman *et al.* have shown that  $\text{RuCl}_3$  catalysed sodium hypochlorite oxidation in a two-phase, emulsified, system gives high yields of azeleic and pelargonic acids. Emulsification helps in improving rates. Azeleic acid can be recovered by extraction with hot water and subsequent crystallization (*J. Am. Oil. Chem. Soc.* 1988, 65, No.4, 611).

### **Thermoplastic Elastomers (TPE)**

TPE continue to attract world-wide attention and show good growth. For automobiles and other applications TPE offer tremendous economic advantage over the traditional multistep thermoset rubber process. TPE offer a unique opportunity for design flexibility in automotive applications. Prime examples of some of the growth areas for thermoplastic olefins are flexible covers and sight shields. The new TPE alloys are gaining importance. (Wright, M.A., *et al.*, *Chemtech.*, 1988, June, p. 354).

### **A novel absorbent for nitrogen**

Japan Oxygen Co. have claimed that  $(\text{Fe}^{\text{II}}(\text{dppe})_2) + \text{Y}$  where  $\text{Y} = \text{BPh}_4^-$  or  $\text{ClO}_4^-$ , and acetone or pyridine or ammonia or  $\text{PhCN}$  or  $\text{MeCN}$ , reversibly absorbs nitrogen. Thus pure nitrogen and enriched oxygen can be simultaneously produced (JP 6342, 717, Feb. 1988, *Cf. Chem. Abstr.*, 1988, 109, 8921).

### **Transesterification of fats**

KaO Corp. has claimed that molten fats (e.g. Palm Oil) can be transesterified (e.g. with stearic acid), without a solvent, in the presence of thermally stable

lipase at 60°C. (E.P. Appl. 257, 388, *Cf. Chem. Abstr.*, 1988, 109, 8381).

### **Alkoxylated esters from alcohols and unsaturated esters**

Union Carbide have claimed that (for instance) ethanol reacts with ethyl acrylate, in the presence of a strongly basic ion exchange resin DOWEX-MSA-1, to give Et-3-ethoxy propionate (E.P. Appl. 254, 291, *Cf. Chem. Abstr.*, 1988, 109, 8399).

### **Effect of surface roughness on solid-liquid mass transfer coefficient**

Van Vliet and Young have studied the effect of surface roughness on the value of the external mass transfer coefficient and have found a profound effect; the enhancement factor appears to be as high as 8 in some cases. Any surface roughness which is significantly smaller than the diffusion film thickness is unlikely to have an effect. The surface roughness can be studied through the concept of fractal dimension. Mass transfer was carried out through absorption of species like phenol p-chlorophenol/dodecyl benzene sulphonates with adsorbent like activated carbon, polymeric materials, etc. (*Chem. Eng. Comm.*, 1988, 69, 81-94).

### **4A Zeolites from calcined kaolins for use in detergents**

Costa *et al.* have shown that 4A zeolite can be made by calcination of Kaolins. Experiments were carried out in 1 liter and a pilot plant 50 liter reactors; gels were prepared by dissolving pretreated Kaolins in an NaOH solution. After ageing the gels were heated to the desired crystallisation conditions. At a capacity of 30,000 tpa the cost of production under conditions in Spain, works out to be \$0.43/Kg. (*Ind. Eng. Chem. Res.* 1988, 27, 1291).

### **Catalytic membrane for simultaneous reaction and separation: Dehydrogenation reaction**

Sun and Khang have shown that a vycor glass membrane reactor, impregnated with a Pt catalyst, can be successfully used for a dehydrogenation reaction — cyclohexane to benzene. Here the permeation of the product allows conversion to exceed equilibrium conversions under conditions when product(s) is (are) not removed. Strong internal mass transfer resistance exists in this reactor (*Ind. Eng. Chem. Res.*, 1988, 27, 1136).



## IBRD cautions ONGC on output levels

The Oil and Natural Gas Commission (ONGC) has recorded significant increases in productivity in all areas of its operation over the period 1980-81 to 1987-88. Yet the World Bank has warned that it may be difficult to maintain production levels because the rate of exploitation has been greater than the rate of discovery of fresh oilfields.

ONGC sources argue "that a slight overstrain on the system yields better results than aiming for lower targets". But the World Bank maintains that India's energy-wasteful strategy of development is running out of the domestic petroleum necessary to sustain it.

The Bank's just published confidential report for 1988 notes critically that energy use has grown faster than gross domestic product (GDP) by a factor of 1.2 to 1.5.

"Discoveries of oil reserves have not kept pace with the increase in domestic oil production in the last few years. The Bombay High Oilfield, which accounts for about 70 per cent of India's domestic oil production, has now reached a production plateau. In the years ahead, its production is likely to decline. Crude oil production has virtually stagnated since 1985", says the report.

According to ONGC sources, oil production per employee increased from 327 tonnes in 1980-81 to 644 tonnes in 1987-88, registering a 97 per cent increase. The leap in productivity reflected in the gas sales per employee was even greater, showing a 293 per cent increase.

But the greatest increase in productivity is evident in the figure for the production of LPG. During this period LPG productivity registered a 356 per cent increase.

Drilling performance, expressed in metres/rig months, is termed "cycle speed". During the period 1980-81 to 1987-88, the cycle speed increased from 475 to 675 metres/rig months.

Gains in productivity are reflected in the financial performance of the organisation. The profit after tax has swollen from a mere Rs. 46.57 crores during 1980-81 to Rs. 1,505 crores in 1987-88.

### ONGC COPTER PLUNGES INTO BAY

A helicopter chartered by the Oil and Natural Gas Commission (ONGC) with ten people aboard, reported missing at sea has crashed into the Bay of Bengal, an ONGC spokesperson said on August 13.

The fate of the two pilots and eight passengers is not known.

A massive search for them has been launched by Indian Navy ships, Air Force aircraft, the Coast Guard and ONGC supply vessels.

An Indian navy ship on the search and rescue mission found the debris of the helicopter about 16 km east of Pondicherry, a navy spokesman said in New Delhi.

He said the ship had spotted one life raft, two seats and other pieces of wreckage of the aircraft, which was chartered from the Pawan Hans Corporation and was on offshore duty for ONGC.

The Dauphin helicopter which had taken off from Madras on Aug. 12, made several trips to the 'Badrinath' platform and the ONGC drilling ship 'Sagar Prabhat'.

Soon after it took off from 'Sagar Prabhat' around 1500 hrs, on Aug. 12, the ONGC radio base at Madras lost contact with the aircraft, the ONGC spokesperson said.

Apart from the two pilots, the eight people on board were employees of Scan Drilling Company, Flow Petrol, Schlumberger, Fairmax Catering Service and Interads — hired by ONGC for its offshore operations, he said.

### For Your Regular Requirements Of :

AMMONIUM BICARBONATE (MANGALA)  
BLEACHING POWDER (MODI & METTUR)  
SULPHATE OF ALUMINA (AAC)  
CAUSTIC SODA FLAKES & SOLID  
SODIUM THIOSULPHATE (HYPO)  
SODIUM BISULPHITE & SULPHITE  
SODIUM NITRITE & NITRATE  
SODIUM METASILICATE (KAILASH)  
SODIUM SULPHIDE FLAKE & CHIPS  
SODIUM SULPHATE (GOLDEN)  
SODIUM ACETATE (CAP)  
SODIUM FORMATE (KUMAR)

OXALIC ACID (EXCEL & KUMAR)  
TRISODIUM PHOSPHATE (IRE)  
BORIC ACID POWDER  
SODA ASH & R. B.  
CITRIC ACID (COMMERCIAL & CITURGIA)  
ACETIC ACID (TDC)  
DI-AMMONIUM PHOSPHATE  
TITANIUM DIOXIDE  
HYDRO SULPHITE OF SODA  
SOLVENT DEG.  
BORAX (GRANULAR & CRYSTALS)  
AND ALL INDL. CHEMICALS

Please Contact :

**M/s. MADANRAJ KHICHA**

(ESTD. 1963)

No. 86, Govindappa Nalck Street,  
MADRAS-600 001.

Gram : SESHMADAN

Phones Office : 561850/563381

Resl. : 518263/515106.



## Petrochem prices stabilise

Petrochemical prices, which have been on the ascendant for years, have now peaked and plateaued.

Industry sources attribute the development to consumer resistance. Also, ethylene supply is easing as explosion-hit plants in the US and Europe are being reactivated. Japan has demothballed its old plants, effecting a marginal increase in supply.

Though prices of all ethylene derivatives have peaked and a reversal is evident, a steep fall in prices is most likely and prices of petrochemicals are expected to stabilise in the region of \$ 1,200-1,400, industry sources said.

Monoethylene glycol (MEG) prices the most volatile of all petrochemicals, had touched \$ 1,900 a few months ago. It has now stabilised at around \$ 1,750. Contract supplies are even today being effected at \$ 1,250.

Polyvinyl chloride (PVC), which had peaked to \$ 1,320 per tonne, has now come down to \$ 1,280. Low density polyethylene (LDPE), quoted at \$ 1,585, is now available at less than \$ 1,500 a tonne. High density polyethy-

lene (HDPE) has fallen from \$ 1,650 to \$ 1,400 and is dropping further. Even ethylene, which is no longer traded in the international market, is expected to be available by 1990.

In erecting new petrochemical complexes, the trend abroad now is to serve the needs of the country, and not the export market. This is said to be because of the uncertainty over the continuance of long-term export markets. "The rule of thumb is that investment for export are justified only if there is an assured market which could fetch 30 per cent more than the domestic prices," an industry source said.

As summer is tapering off, demand for gasoline in the Western world is declining. Crude prices have dropped to \$ 13 a barrel. The downtrend is expected to continue as both Iran and Iraq will pump as much oil as possible in their endeavour to rebuild their war-shattered economies.

Industry sources welcomed the Government's decision to allow one and all to purchase polymers from the world market, for actual use or sale. "Ir-

respective of the reason which may have prompted the Government to take this decision, it is in the country's interest. India should take this opportunity to maximise its purchase of crude as well as petrochemicals," an industry source commented.

### RPL GETS NOC FROM GUJARAT POLLUTION BOARD

The Gujarat Pollution Control Board gave a no-objection certificate (NOC) in January 1987 to Reliance Petrochem in Hazira for three projects. They are the HDPE and PVC plants and the setting up of a captive power unit. The board has no objection only from the pollution point of view and no other.

Reliance has yet to get clearance from the environmental appraisal committee of the ministry of environment, Central government, where all environmental questions pertaining to the project are to be discussed. Incidentally, this committee meets every month but the Reliance discussion has not been scheduled so far. The Gujarat Pollution Control Board is also a party to the committee's discussion if the project concerned is in Gujarat.

## CHEMICAL INDUSTRY FOR SALE

**Chemical industry for sale at Hyderabad's prime industrial location-2,440 Sq. Yds.**

**Several product lines-manufacturing import substitutes**

**Facilities include heating, cooling, vacuum transfer and distillation**

**Confirmed orders worth Rs. 30 lacs.**

**Excellent potential. Offers invited**

**BOX NO. 2240**

C/o. CHEMICAL WEEKLY

306, Shri Hanuman Industrial Estate,

G. D. Ambekar Road, Wadala, Bombay-400 031.



# Natural gas discovered in western Rajasthan

Oil India Limited announced its first major discovery of hydrocarbons in Rajasthan where it started looking for oil and gas some three years ago. The first exploratory well drilled by the OIL technicians at Tanot, 115 km north-west of Jaisalmer, has yielded gas accumulations. The hydrocarbon content, including methane and significant amounts of ethane, propane and butane, in the produced gas is about 67 per cent.

The Tanot well, first in a series of six wells to be drilled in western Rajasthan by the OIL before March 1990, was spudded on March 8 and reached its planned depth of 3,513 metres on July 1. Production testing began 15 days later after detailed down-hole surveys and cementation of casing pipes.

During production testing of a promising zone at a depth of 1,950 metres, the rate of flow was a steady 16,000 standard cubic metres (1.6 million standard cubic feet) a day through a six mm beam. Its flowing pressure on the surface was 1,210 pounds a square inch (87 kg/sq. cm). The open flow potential is estimated at over 100,000 standard cubic metres (five million standard cubic feet) a day.

## Optimistic

The geological reserves of the gas struck in well No. 1 at Tanot are estimated at one billion standard cubic metres (35 billion standard cubic feet). The OIL experts are optimistic that drilling in the adjacent structures might lead to the discovery of larger quantities of gas in the Tanot area.

It was in 1985-86 that the OIL carried out the first intensive seismic survey using the vibrosis technique along 8,100 km line covering the entire petroleum exploration area of 28,600 sq. kms licensed to it in Rajasthan. The data was processed at a computer centre set up at Jodhpur.

A comprehensive analysis and interpretation of the data together with the available geological information by three different groups headed by reputed geo-scientists has led to the identification of six drilling targets. The

OIL has retained 10,000 sq km of the area licensed to it for exploring hydrocarbons.

After Tanot, the second exploratory well would be drilled near Ramgarh, about 80 km from well No. 1. The second well is expected to be spudded later this month.

The sanctioned expenditure on the drilling phase is about Rs. 51 crores, which the OIL hopes to utilise during the Seventh Plan period. The cost of the survey phase of the project completed earlier has been Rs. 31 crores. The foreign exchange component of the OIL's Rajasthan project is being funded through a World Bank loan. The tentative allocation is \$25 millions (about Rs. 33 crores).

## HALDIA PETROCHEM PROJECT COST SOARS

The cost of the Haldia petrochemicals project, which has been dogged

by delays in decision-making, has escalated to Rs. 2,000 crores.

This information was given by the Union Industry Ministry, Mr. J. Vengal Rao, while replying to supplementaries on a question on polymer imports raised in the Lok Sabha by Mr. Saifuddin Chowdhury.

Mr. Vengal Rao said all the clearances needed to be obtained from his Ministry have been given and the project promoters need to get other financial approvals.

In reply to the main question, the Minister admitted that there would be short fall in the demand and availability of polymers in the country beyond 1990. According to him, the shortfall in 1990-91 would be 368,000 tonnes as the production would be 490,000 tonnes against a demand of 858,000 tonnes.

The Minister also assured the member that steps are being taken to expedite the setting up of new petrochemical projects in the country.

AVAILABLE

ACETONE

Contact



Sultanchand Bimalprakash

403, Faiz-E-Outbi, 375, Narsinatha Street, Bombay-400 009.

Phones : 330391/323425/333298

Cable: "DELHICHEM"

Telex No. : 011-75469



## ONGC output may exceed target

The Oil and Natural Gas Commission is likely to achieve production of nearly 144 million tonnes against the original target of about 143 million tonnes during the Seventh Plan. ONGC sources say that this estimate is based on the achievement of targets in the first three years of the Seventh Plan, which has been cumulative 82.1 million tonnes against which ONGC achieved 83.28 million tonnes.

Col. S. P. Wahi, chairman, ONGC, said that the increase in production was largely due to the new oil and gas discoveries, accelerated build-up in reserves, innovative strategies adopted for putting these discoveries into production through the early production systems and enhanced oil recovery scheme.

He said that a notable feature of the Seventh Plan had been a build up in the geological reserves which is also a reflection of the intensification of its exploratory activity during the Seventh Plan. As against a target of 970 MMT reserve accretion during the plan pe-

riod already 823 MMT of oil and oil equivalent of gas had been added in the first 3 years of the Seventh Plan (1985-88).

ONGC is reviewing its targets for the Eighth Plan, keeping in view the large number of discoveries, made in the recent past, both onland and offshore. As per the existing plan, the cumulative production for the Eighth Plan is expected to be about 280.7 million tonnes of oil and oil equivalent gas.

The all round gains in productivity is amply reflected in the Impeccable financial performance of the organisation. The profit after tax has swollen from a mere Rs. 46.57 crores during 1980-81 to Rs. 1505 crores in 1987-88.

With the government equity remaining at the level of Rs. 432.85 crores since 1981, the financial resources for development and growth year after year have been primarily met through internal resources generation and commercial borrowings. The total internal

resources generation during 1987-88 has been Rs. 2209.45 crores which is 107 per cent of the plan expenditure.

Reacting to the charge of "indifference" towards indigenisation of equipment Col. Wahi said that a large number of capital items were already being manufactured and supplied by the companies in the public and private sector to ONGC.

In fact, he said, it was estimated that the domestic industry was today supplying more than 50 per cent of the oil sector's requirement of equipment and materials like rigs, offshore platforms, offshore supply vessels, casing pipes, oil field chemicals and cement.

Mazagaon Dock Limited has so far fabricated 30 offshore platforms for ONGC and 34 onland rigs have been supplied by BHEL. Likewise, 18 offshore supply vessels in operation for ONGC have been manufactured by Indian yards. BPCL and PIL are currently engaged in executing 46 cement units for ONGC.

Services worth Rs. 309.52 crores were indigenised during the year 1986-87, compared to the figure of 1984-86, when services worth Rs. 276.32 crores were indigenised.

### 4 FLOAT GLASS UNITS PLANNED

The Union Minister of State for Industries, Mr. M. Arunachalam, said recently that it was proposed to start four float glass industries at a cost of Rs. 200 crores each.

Two industrial units, including Tamil Nadu Industrial Development Corporation (TIDCO) had applied for licences, he told newsmen in Madurai.

Mr. Arunachalam said 1640 sick units had been revived in Tamil Nadu since the President's rule came into effect.

Mr. Arunachalam said 100 district industrial growth centres at a cost of Rs. 2,500 crores would be set up in the country.

Talking about the Government's efforts to accelerate the industrial growth in Tamil Nadu, Mr. Arunachalam said till the end of 1987, 122 letters of intent were given by the Centre for setting up industries. It worked out to 12.3 per cent of the total share of such letters of intent extended all over the country.

FOR YOUR REQUIREMENTS OF :

**Zinc Sulphate**

(FERTILISERS GRADE)

**Copper Sulphate**

(TECHNICAL GRADE)

**Zinc Chloride**

**Zinc Hydroxide**

**Ferrous Sulphate**

**Lead Acetate**

**Calcium Chloride**

(HYDROUS & ANHYDROUS)

**Turkey Red Oil**

(ALL GRADES)

Please Contact Manufacturers :

**RASHDEEP CHEMICALS**

Plot No. 3451/B, GIDC Industrial Estate,

ANKLESHWAR-393 002.

ALSO WANTED DISTRIBUTORS (STATE-WISE)



## Plan panel stress on natural gas use

The Planning Commission has emphasised the need for taking expedient decisions on use of natural gas for power generation, increasing the capacity in the States' sector and streamlining of the approval system to meet the anticipated shortage of power in the Eighth Plan.

This follows a recent exercise carried out by the Commission which has shown that the electricity generation requirements will be 524 billion units for an Eighth Plan GDP growth rate of six per cent, 480 billion units for a growth rate of six per cent and 460 billion units for a growth rate of 5.5 per cent.

A more detailed exercise on the basis of a GDP growth rate of six per cent has indicated that after taking out the expected generation of about 25 billion units from captive power, the generation requirements from public utilities will be about 455 billion units.

Against this, the gross generation, after an addition of 38,000 mw capacity during the Eighth Plan, is estimated at about 410 billion units.

The Commission feels that it may be possible to step up this generation to about 450 billion units provided a time-bound action plan is taken up for improving the performance and productivity of the existing units, operation of the power system and reduction of the time required for bringing the new units to full load operation.

The small overall gap between demand and availability may be met by generating power from Chukha and through other measures though there may still be gaps in certain regions.

However, to meet the peaking requirements, a capacity of over 4,000 mw will be required in addition to 38,000 mw for the six-per cent growth rate. This does not seem to be in sight and it is presumed that the peak shortage will continue.

The Commission, therefore, feels that a capacity of 38,000 mw is the minimum required for the Eighth Plan. So far, a capacity of 22,345 mw has been approved for the Eighth Plan.

However, out of this, only 19,385 mw capacity is under implementation at present. A capacity of 2,570 mw is held up due to forest and environmental clearance and another 390 mw is wanted of delays in foreign tie-ups. The rest of the capacity of 15,800 mw is yet to be approved due to various reasons. A capacity of 8,700 mw

is awaiting forest and environmental clearance and 2,000 mw, the Public Investment Board's and Cabinet Committee's approval. Another 900 mw capacity is held up due to fund constraints, 700 mw due to inter-State disputes while 3,400 mw capacity projects are still under formulation.

The Commission also feels that several projects are likely to slip over to the last year of the Eighth Plan or to the start of the Ninth Plan because of the long gestation period involved.

As such, the Commission has stressed it is important that short gestation period projects, which could be based on natural gas are taken up immediately. Already 2,400 mw of gas-based power projects are under formulation. In addition, the Commission has found that about 4,000 mw capacity power plants could be set up, based on the natural gas available in Hazira, Gandhar, Tripura, Assam and Krishna-Godavari.

However, the Commission has pointed out that it is necessary to take a policy decision on utilisation of natural gas for power right now so that these projects could be taken up within the next six to 12 months. Such a decision will ensure that the new capacity of

38,000 mw envisaged for the Eighth Plan comes up and the possible slippages to the tune of 1,600 mw are also taken care of by the gas-based power projects.

Regarding the funding of the power projects which are to materialise during the Eighth Plan, the Commission feels that there is not much problem in case of Central sector projects as only a small increase in the net budgetary support would be required next year after utilising external assistance and market borrowings.

In case of the States, however, an increase of Rs. 1,261 crores is required in the Seventh Plan outlay. This would require larger institutional funding and allocation by States of a larger percentage of their Plan outlays to the power sector.

As such, the Power Finance Corporation, may have to be allowed higher equity to have a larger borrowing programme.

The Commission also feels that it would be necessary to take measures for streamlining the various other approval systems connected with the implementation of power projects, their implementation and management power systems operations. These measures, along with a decision on pending projects would be necessary to ensure that full benefits are realised in the Eighth Plan.

FOR YOUR REQUIREMENTS OF :

VINYL SULPHONE BASED REACTIVE DYES

SOLAZOL BLACK B.  
SOLAZOL YELLOW FG  
SOLAZOL YELLOW RTN  
SOLAZOL YELLOW R  
SOLAZOL RED 5B  
SOLAZOL RED C2G  
SOLAZOL VIOLET 5R  
SOLAZOL BROWN GR  
SOLAZOL ORANGE 3R  
SOLAZOL BLUE 3R  
REACTIVE BLUE MR  
REACTIVE BLUE HGR

CI REACTIVE BLACK 5  
CI REACTIVE YELLOW 42  
CI REACTIVE YELLOW 24  
CI REACTIVE YELLOW 44  
CI REACTIVE RED 35  
CI REACTIVE RED 106  
CI REACTIVE VIOLET 5  
CI REACTIVE BROWN 18  
CI REACTIVE ORANGE 16  
CI REACTIVE BLUE 28  
CI REACTIVE BLUE 4  
CI REACTIVE BLUE 5

BROMAMINE ACID

Please Contact Manufacturers :

**Solar Dyes Industries**

Plot No. 37, G.I.D.C., PANDESARA-394 221, Dist: SURAT

Phone: O. 89560/89760 R. 36738/28816



## New energy policy debate

The role of hydrocarbons in the new energy policy, productivity achieved by the Oil and Natural Gas Commission and the programme of indigenisation of equipment by the industry are the three areas around which most of the controversies or debates take place reports Kumar Ketkar in *The Economic Times*:

The debate became particularly sharper with more and more gas discoveries and large scale flaring of gas. Whether gas should be used for petrochemicals (including fertiliser) or for power was one major aspect of the debate. The second related to the question of productivity vis-a-vis prognosticated reserves. Just as the ONGC's activities were expanding, the public and private sector industry began to raise questions concerning indigenisation. They legitimately feared that the worldwide slump in the international equipment market, the local units would be sidelined and the ONGC would go for massive import.

The debate is unlikely to be resolved easily.

Ever since the first oil crisis in the

mid-seventies, the basic tenet of India's energy policy had been to treat coal as a primary source of energy. The first natural reaction was to substitute coal for other fuels wherever possible. Since this policy was pursued for the power generation sector also, the share of coal as a primary source of energy increased.

But during the last seven years perceptions began to change rapidly, mainly because the ONGC succeeded in increasing the oil production three-fold, from 9.21 million tonnes to 27.91 million tonnes. The gas production increased from 970 million cubic metres to nearly 6,000 million cubic metres, i.e. more than six times.

According to a report prepared by the Bureau of Industrial Costs and Prices, the new energy policy has to mean moving towards utilisation of hydrocarbons as a source of energy in the power generation. According to BICP, this will not only reduce costs but also will require much less capital resources in the coming plans for creating additional capacities in the power sector and also in the transportation

sector. The BICP report says that the source could be fuel oil, natural gas, domestic or imported.

It is at this point that the debate on "options" has become sharp. Should India continue to import, particularly when the oil experts fear sharp rise in oil prices again. Wouldn't proper utilisation of the hydrocarbon resources limit the import? Hadn't India declared its objective of near-self-sufficiency by the end of the century?

The BICP study argues that India will have to be substantially dependent on imports of hydrocarbons for several years to come. Naturally, the consumer price for hydrocarbons will have to be based on import parity price reflecting the special costs of imports. These prices will also define the limits for the domestic coal prices at producer as well as consumer level. Which means, if the new energy policy as recommended by BICP is accepted, the CIL will have to be given full freedom to price its output, instead of administering the price.

In other words, the BICP is suggesting going away from the present administered price scheme in the coal sector to a "regime of efficiency prices that encourages optimum inter-fuel substitution while minimising the total energy supply costs to the economy."

According to BICP the direct import content in the domestically produced coal has been increasing over the time. Consequently, the net direct import requirement of the energy sector due to the proposed New Energy Policy will be lower than what the gross imports indicate. If one takes into account supplies which the New Energy Policy would achieve, then even these net energy imports may further decline even if we take into account direct foreign exchange balance in the energy sector.

Additionally, the BICP argues that if one takes into account the import replacement effects through the better performance of energy sector, there is little doubt that the New Energy Policy would only further improve the net balance of payment position.

The strategic advantage of the New Energy Policy, according to the BICP is that it would create an all-India gas distribution infrastructure in the economy which will enable India to expedite exploitation of natural gas reserves.

It will also enable creation of new capacities in power generation sector within a minimum possible time.

Gram: SANCHEM

Hello : 28237/28238 Office  
27970 Resi.

**Attention**  
**Indentors, Exporters For**  
**Bismark Brown R**



**Crocein Scarlet MOO**

Contact Manufacturer :

**M/s. SANTOSH CHEMICALS**

2nd Floor, Everest Building,

Nr. Railway Goods Yard,

SURAT-395 003.



## Good scope for rubber industry

There is good scope for undertaking synthetic rubber and rubber goods production which include SBR, PBR, Butyl Rubber and Rubber Products like conveyor belts, contraceptives, specific rubber hoses etc. which are important substitute items. Presently there are over 3800 units in the country including 132 organised sector units concentrated in the States like Kerala, Maharashtra, West Bengal, Punjab and Tamil Nadu. The capital investment in the industry is estimated at Rs. 1500 crores producing goods worth Rs. 3200 crores and providing employment to over 2 lakh persons. Import of rubber and rubber goods has increased to Rs. 128 crores. India's share in the world market of \$ 14,500 million is less than 1%. These are the findings of the extensive surveys of rubber and rubber goods industry in India carried out by Industrial Extension Bureau.

The Study further reveals that there is a technological gap in the production of butyl rubber and therefore the know-how for butyl rubber is required to be developed indigenously in addition to the upgradation and modernisation of the existing production route of SBR. The report titled 'Rubber and Rubber Goods Industry in India' represents indepth study and covers all essential aspects of rubber and rubber goods industry including present installed capacity, production, import and export, import and export policy, status of technology, foreign collaborations approved, list of indenting agents, world buyers, status of rubber machinery and list of machinery manufacturers, consultants offering consultancy services for rubber and agents offering know-how, availability of raw materials, market price of rubber, the list of rubber and goods manufacturers and above all twenty project briefs on rubber goods items.

The Report is available from Industrial Extension Bureau, Nanalal Chambers, Ashram Road, Ahmedabad 380-009. The publication is priced at Rs. 550/- per copy inclusive of packing and forwarding charges payable through crossed cheque/Demand Draft drawn

in favour of Industrial Extension Bureau.

### CALL TO WAIVE IMPORT DUTY ON RUBBER

The All-India Rubber Industries Association has called upon the Government to maintain the release price of imported rubber by STC at Rs. 17,000 per tonne by waiving the customs duty of 35 per cent or, if needed, by providing a subsidy. In a statement on Aug. 12, the association has questioned the decision of STC to raise the price of RMA-4 grade rubber by Rs. 2,000 to Rs. 19,000 a tonne (ex-Madras).

In doing so, it said, the corporation has violated the sanctity of the buffer stock scheme introduced in 1986 to stabilise the supply and price of natural rubber for the benefit of both the growers and the consumers.

The association is critical of STC messing up the release programme. According to it, the suspension of rubber release by the corporation on June 24 has led to a flare-up in local market prices to Rs. 19,250. The suspension came after STC had distributed only 23,000 tonnes against an authorisation to sell 30,000 tonnes. STC has no mandate to link the release price with the domestic market prices, the association contends.

In the circumstances, the only way to regulate the market is to waive the import duty on natural rubber currently pegged at 35 per cent.

The Government, it is pointed out, has already collected about Rs. 54 crores as import duty on natural rubber over the last three years. If the cost of imported rubber happens to be high even after waiving the duty as suggested, the Government should neutralise the increase by way of a subsidy drawn from the funds built up by the customs duty already collected.

**NOW AVAILABLE  
AT VERY COMPETITIVE RATES  
AND  
IN BULK QUANTITIES.**

- ★ Sodium Chloride I.P./A.R.
- ★ Potassium Chloride I.P./A.R.
- ★ Sodium Lactate 60% U.S.P.
- ★ Sodium Acetate I.P./A.R.
- ★ Sodium Citrate I.P./A.R.

Manufacturer :

**Denis Chem Lab Ltd.**

Chhatral,  
Tal. Kalol (N. G.),  
Dist. Mehsana,  
GUJARAT-382 729.  
Phones : (02764) 2027/2127



# ATTENTION EXPORTERS

Offering in Bulk

**Pot. Iodide B.P./USP**  
**Chloramphenicol B.P./USP**

Manufacturers :



**ISHITA PHARMACEUTICALS**

P. Box 12001, PALDI,

AHMEDABAD-380 007.

Phones : 78560, 78218 (R)

For Your Requirements Of :

- \* Sodium Sulphite and Bisulphite
- \* Magnesium Chloride — Crystal & Solid
- \* Hydro-Quinone and 2:5 Di methoxy Aniline
- \* Stearic Acid, Oleic Acid, Glycerine, Fatty Acid
- \* Sodium Bromide, Tin Chloride, Tin Sulphate
- \* Filter-Cloth, Cotton, Polyester, Polypropylene, HDPE
- \* Packing material — HDPE, LDPE, PVC and Polypropylene
- \* Filter-Press-Hydraulic, Castiron, Polypropylene, Wooden, Stainless steel, Rubber lined, etc.
- \* Cast-Iron Powder
- \* Aluminium Chloride-Anhydrous, Crystal & Powder
- \* Soda-ash, Caustic soda, Solvents etc.
- \* Pesticide — Emulsifiers and Glycols
- \* Zinc Oxide, Stearates and PVC stabilizers
- \* Pigments, Titanium Dioxide
- \* Calcium Chloride — lye-solid, anhydrous
- \* Aluminium ingots & scrap
- \* Di Calcium Phosphate Anhydrous IP
- \* Magnesium Stearate IP

Contact :

**ORGANO INC**

9, Aroonodaya Society,  
Alkapuri, BARODA-390 005.  
Ph: 323342 Resi : 322895

**ORGANO CHEMICAL CORPORATION**

22, New Cloth Market,  
Outside Raipur Gate, AHMEDABAD-380 002.  
Phone: 364289, 346877 Resi.: 446155

TV ADS

Contact For Most Competitive CIF PRICE For

ATENOLOL  
BROMOHXINE HCL  
CLOTRIMAZOLE  
BETA/DEXAMETHASONE BASE  
GLYCINE  
INDOMETHACIN  
LEVAMISOL  
RANITIDINE HCL

DI PHENYL AMINE  
FORMIC ACID 85%  
GLYCERINE CRUDE/USP  
MEK/MIBK  
METHYLENE CHLORIDE  
MORPHOLINE  
POP/PTBP  
PERCHLOROETHYLENE

**SATYAN PHARMACEUTICALS PVT. LTD.**

Diamond House, 2nd Floor, 491-493 Kalbadevi Road, Bombay-400 002.  
Tel. : 25 00 50/31 62 50 Telex : 011-5210 SPL IN.  
Branch Office : 114, Thambu Chetty Street, Madras-600 001.  
Tel. : 51 39 67/51 08 51



# India may face aluminium shortage

India may face a shortage of about 50,000 tonnes of aluminium metal during the current fiscal year (1988-89) as against the "misplaced optimism" of surplus stock by the Union government. Domestic aluminium user industries feel, taking into consideration the recent production trends, crippled further by the technical troubles in Nalco and power famine faced by the smelters in the southern region, an estimated or even marginal surplus is unreliable.

The government's pronouncement of anticipated indigenous metal surplus within the current fiscal and concurrent provision to allow imports under Open General Licence (OGL) by actual users at concessional customs duty coupled with talks of price decontrol have afflicted the users, industry in general and the units in small scale sector in particular because they have already claimed to be on the verge of closure for want of raw material.

Viewing the country's present aluminium scenario a piquant one. The Eastern Aluminium Rollers and Fabricators Association (EARFA) has urged the Union steel and mines minister, Mr. M.L. Fotedar to undertake for meticulous planning and strategy for maintaining and regulating the supply of metal to the user industry. The association submitted a memorandum to the minister recently, elaborating various aspects of the demand and supply situation. The EARFA pointed out that small scale utensil manufacturers had suffered a lot due to irregular and erratic supply of metal for the past several years. The W.B. state owned Balco had suspended all allocations to SSI units since March this year. Indal and Nalco continued to face acute power shortage and shut-downs. With Nalco suffering certain technical problems, metal availability has become erratic and substantially reduced. In the circumstances, small scale units, numbering about 100 all over the country had been adversely affected and were perplexed. These units were, in fact, finding it difficult to maintain their operation. The current total requirement of commercial grade aluminium ingot for utensil manufacturers amounted to about 60,000 tonnes per annum. Against this background, EARFA urged Mr. Fotedar not to decontrol aluminium prices at this juncture. Such a move should be prudent only

should there be an actual physical surplus of metal production rather than on the basis of a marginal anticipated surplus during the current year. In its memorandum, it stated that once the price control was removed, the primary aluminium producers would take full advantage of the current scarcity conditions.

The association suggested that administrative pool prices could be a viable alternative now to costly aluminium imports. The high cost of imported aluminium could be well spread over domestic availability under the pool price system. Another viable alternative, it suggested, could be waiver of all duties on aluminium and aluminium scrap imports by actual users. This was suggested because scrap was cheaper in the international market.

## PLEA TO REDUCE IMPORT DUTY ON ZINC, NICKEL

The non-ferrous metal user industry is facing several problems due to the escalating prices of almost all metals such as aluminium, zinc, nickel and tin and the near scarcity of aluminium.

The Bombay Metal Exchange pre-

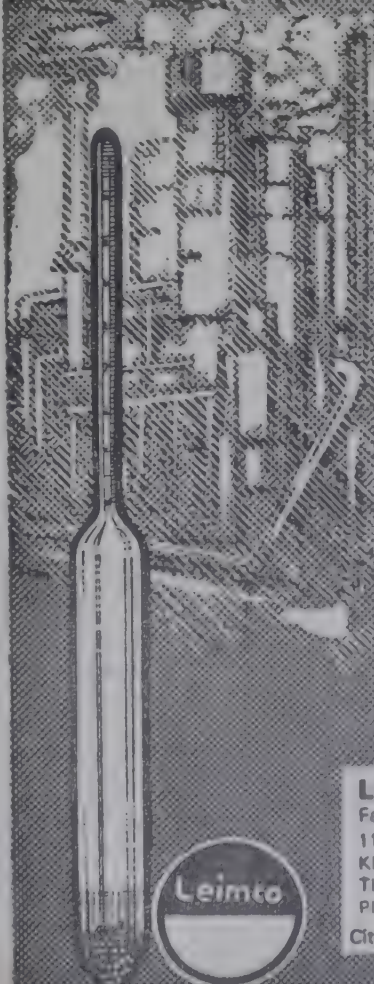
sident Sevantibhai Morakhia addressing a press conference organised by the metals associations said that the government should provide relief measures to the worst affected metals such as zinc and nickel.

The government should reduce the customs duty on zinc and nickel as in the case of copper, he said.

Indian Non-ferrous Metals Manufacturers Association president Balakrishna Binani said the supply of aluminium is scarce particularly during April and June mainly due to a decline in production as a result of power shortage.


Moreover, last year's unserved demands and backlog also have to be covered during this quarter. The requirements of user industries will have to be, therefore, adequately taken care of by planning imports in such a way that the industries would not face any shortages.

The vital but unknown factor in this year's projection of metal availability would be the production by National Aluminium Company (NALCO). Therefore, a very close monitoring of production performance (especially of Nalco) is required and any deviation should be made by adjusting the imports, Mr. Binani added.



Manufacturers of:

## GLASS HYDROMETERS



**PETROLIUM** ◆ Petroleum  
**Density Hydrometers as per**  
**I.S. 3104 Part I. Specification with**  **Mark**

**Specific Gravity, Baume, Brix, Sikes, Twaddle  
 Battery Hydrometer, Direct % Reading Thermo-  
 Hydrometers for Caustic Soda/lye, Nitric Acid  
 Sulphuric Acid, Hydrochloric Acid, Glue and  
 Ammonia for different purpose.**

Our other products :

- MICRO PIPETTES (LAMBDA)
- CONSTANT TEMPERATURE BATHS
- PRECISION INDUSTRIAL GLASS THERMOMETERS
- LABORATORY GLASSWARES
- INDUSTRIAL GLASS EQUIPMENTS

3104

PART 1

**PRODUCTS KNOWN FOR QUALITY & PRECISION**

**LEIMCO**  
 Factory :  
 119, Purjani Industrial Estate  
 Khopet, Eastern Express Highway  
 THANE-400 801 (INDIA)  
 PHONE : 502672

**LEIMCO**  
 Office  
 Cavel X Lane, No. 4  
 Kalbadavi Road  
 BOMBAY-400 002 (INDIA)  
 PHONE: 422 7990

City Unit 127, Madhani Estate, S. Bapat Marg, Dader BOMBAY 400 028



## Big houses must meet own forex needs: Vengal Rao

The Government has asked big industrial houses to generate their own foreign exchange to finance imports.

Making this declaration at a workshop organised by the Associated Chambers of Commerce and Industry (Assocham) the Union Minister of Industry, Mr. J. Vengal Rao said, "Industry will have to step up its exports efforts to meet their foreign exchange needs".

Mr. Rao further observed that the industry needed to be more competitive in view of the dismantling of regulations. Quality and price, therefore, would have to be the keywords for growth, he said.

The Minister, however, hinted that more facilities for houses are in the offing to help big houses play a better role in industrialisation. MRTP houses had not been left out of the Government's liberalisation plans, he said.

In this regard he stated that 50 more industries had been added in the list of delicensed industries for MRTP companies in October, 1987.

while a scheme had been announced for maximisation of production during the Seventh Plan in April, this year.

The Minister further observed that the Government's expectations looked at the big houses for getting the latest technology into the country play a role in building a dynamic industrial base.

Mr. Rao also observed that the industry needed to play a bigger role in ensuring a higher income for the rural populace as a part of an integrated strategy for promoting economic development of the country.

Mr. Rao stressed the need for developing the component industry, integrating the small-scale sector with the large sector. He said this deserved serious attention on part of the industry. He cited the example of Japan in the overall integration achieved between various sectors.

The Minister also urged the industry to generate industrial raw materials in view of the rising in-

ternational prices. The country has also to be on the lookout for the latest technology so that the consumption of raw materials per unit of output is reduced he added. In this regard, he said, there is a view that the domestic industries use more raw materials per unit of output than industries in other advanced countries.

Mr. Rao expressed his satisfaction at the suggestion that a 12 per cent or more growth target in the manufacturing sector could be achieved during the next decade.

Earlier, the Assocham President Mr. L.M. Thapar, urged the Government to accelerate the process of liberalisation in such a manner that MRTP houses and FERA companies, which account for a bulk of the investment are freed from the restricted aspect of existing legislation. "Our licensing laws should not hold down size nor procedures limit exports", he said.

The Chairman of Assocham's Industry Committee, Mr. G.H. Singhania, said the export sector would have to play a far more dynamic role to sustain the imports required for higher growth and for servicing earlier debts.

## YOUR PACKING PROBLEM IS NOW SOLVED.

Because Reliance Jerrycans & Barrels are manufactured on most sophisticated automatic Blow-moulding Machines with rigid quality control and passing through all kinds of different tests assure you the best guaranteed protection to your precious products.

# Reliance

## JERRYCANS & BARRELS



Manufactured by:

## RELIANCE PLASTICS

11-A, Unique Industrial Estate,  
Opp. Jawahar Talkies, Mulund (West),  
Bombay-400 080.

Phone: 5619994, 5618131 Res: 5613186



*from quality leppers*



## Thrust on exports to narrow deficit

The Planning Commission has called for effective measures for increasing exports and containing the current account deficit during the Eighth Plan.

The Commission has projected that with net invisible earnings of around Rs. 4,000 crores a year and the current account deficit (which would correspond roughly to the capital inflow from abroad) of 1.5 per cent to two per cent of GDP, the annual rate of growth of imports will be 9.9 per cent for a GDP growth rate of 5.5 per cent.

For achieving a GDP growth rate of six per cent, the projected annual rate of growth of imports is 10.8 per cent. The import growth rate will increase to 12.6 per cent annually for a GDP growth rate of seven per cent.

The derived annual rate of growth of exports has been put at about 5.5 per cent for a GDP growth rate of 5.5 per cent, 15.6 per cent for a GDP growth rate of six per cent and 17.8 per cent for a GDP growth rate of seven per cent.

The commission has noted that if the foreign capital inflows are set at two per cent of GDP, the absolute amount of such flows would be around Rs. 50,000 crores over five years. The corresponding figure if inflows are set at 1.5 per cent of GDP will be around Rs. 37,000 crores.

The feasibility and sustainability of inflows of this order will need to be established, the Commission has said.

The Commission has pointed out that in making these estimates, it has assumed the import elasticity at 0.8 per cent on the basis of the past data. However, a shift away from the import substituting sector would tend to raise the import bill further. Exports at the margin would also tend to be more import-intensive.

The growing dependence on imports for meeting domestic petroleum requirements would tend to increase the import bill.

The required rates of growth of exports even for a 5.5 per cent GDP growth are highly relative to actual achievements in the past. As such detailed exercises on export possibilities and import savings will be required to contain the balance of payments problems that could arise

in the course of the Eighth Plan, the Commission has said.

The Commission has found that the scope for increasing exports of traditional commodities like tea, coffee, unmanufactured tobacco, cashew kernels, iron ore, etc. will, be somewhat smaller in the Eighth Plan.

Larger increases will be possible in respect of non-traditional commodities like processed foods, marine products, readymade garments, leather and leather manufactures, chemicals and allied products, gems and jewellery, engineering goods, including electronics and computer software, and project and consultancy services.

A preliminary assessment of export prospects for thrust commodities made by the Commission has indicated the possibility of a growth in volume by about eight per cent a year on a sustained basis during the Eighth Plan.

This would require an annual average volume growth of over 10 per cent a year in the value of exports from selected seven non-traditional export commodities.

Further, a volume increase of around five per cent in export earnings from all other items would be needed during the Eighth Plan.

The Commission has, therefore, suggested several measures for increasing exports. These include selected imports of machinery for upgradation of technology and other additional imports required for promotion of exports, increased imports of uncut diamonds, liberal imports of hides and skins for leather exports and supply of raw materials to export industries at international prices.

### EXPORTS: CONCERN OVER FALL IN INDIA'S SHARE

Recent liberalisations by the Union Government are an inevitable response to the stage of development attained by the Country's economy, said Mr. R.N. Malhotra, Governor of the Reserve Bank, addressing a United Nations Development Programme (UNDP) organised meeting with the Federation of Indian Export Organisations (FIEO).

The conclusions of the several recent UNDP meetings with Indian organisations including the Bombay Chamber of Commerce and Industry

(BCCI) were discussed at the meeting.

Mr. Malhotra said that liberalisations cannot be reversed because the economy is so complex that it cannot be subjected to detailed regulations. Nobody really has all the answers, he claimed. A lot more has to be left to people who are in the field of production, exports and business.

The RBI Governor noted that India's share of world's exports had declined over the years. He lamented that the contribution of large industry which used up a great deal of foreign exchange had been weak.

Mr. Gamil Hamby, UNDP resident representative, noted that the purpose of these seminars of India organisation is to work out a strategy for direct UNDP assistance to the Indian private sector. He noted that India got the second largest grant from UNDP, next only to China. Yet India is also the largest donor to the programme of any developing country, giving \$7.5 million in foreign exchange, and providing critical technical expertise for UNDP programmes.

Mr. Ramu Deora, President, FIEO, made recommendations concerning export packing credit advance, and suggested that units exporting more than 50 per cent of their production be given special credits. He asked RBI to ensure that operational officers understand certain new liberalisations.

Mr. Deora also wanted the prescribed limit of assessment and investments for small-scale industries be raised from Rs. 35 lakhs to Rs. 1 crore.

### 1987-88 EXCISE REALISATION RS. 16,633 CR.

The revenue realisation from Central Excise duties during 1987-88 has been provisionally put at Rs. 16,633 crores, the Minister of State for Finance, Mr. Ajit Kumar Panja said in the Lok Sabha recently.

The figures for 1985-86 and 1986-87 were Rs. 12,956 crores and Rs. 14,470 crores, respectively. The realisation during 1987-88 was 1.14 per cent less than the Budget estimate, he said in a written reply.

During 1987-88, the revenue realisation from Customs duties were provisionally put at Rs. 13,636 crores. It was Rs. 9,526 crores in 1985-86 and Rs. 11,475 crores in 1986-87, he said.



## Metals import bill to go up Rs. 400 crores

The import bill for canalised non-ferrous metals for 1988-89 would be higher by Rs. 400 crores over 1987-88.

The bill is expected to be around Rs. 1,200 crores for the current financial year against Rs. 1,000 crores last year. However, the 1987-88 bill includes Rs. 160 crores for import of 60,000 tonnes of aluminium, which has now been put on open general licence (OGL).

The steep jump in the import bill is attributed mainly to rise in prices of non-ferrous metals in the international market and partly to increase in quantity to be imported.

During the year, about 80,000 tonnes of copper is estimated to be imported at a cost of over Rs. 600 crores against 75,000 tonnes imported for about Rs. 450 crores in 1987-88, thereby, showing an increase of about 28 per cent in the international prices.

A substantial increase in quantity of zinc to be imported is also expected. As against last year when

65,000 tonnes were imported, in 1988-89 it is expected to go up by 10,000 tonnes to 75,000 tonnes.

Value-wise, Rs. 225 crores have been earmarked for import of 75,000 tonnes. Last year, Rs. 200 crores was spent for imports.

During the first four months of the current year, 19,804 tonnes of copper valued at Rs. 131.79 crores has already been imported against 21,828 tonnes valued at Rs. 105.89 crores imported during the same period last year.

A close look at the figures clearly, indicate the marked rise in international prices.

Similarly about 20,341 tonnes of high-grade zinc has been imported valued at Rs. 75.81 crores during April-July period against 12,254 tonnes valued at Rs. 37.30 crores during the same period of last year, thereby, indicating 18 per cent rise in prices.

However, in the case of lead the picture almost remains the same. This year about Rs. 40 crores has been earmarked to import about

24,000 tonnes which corresponds to the figures of last year.

But, for the four months period the figures available here indicate the rise in international price for this metal also. For instance, during the first four months of this year about 9,111 tonnes of 99.97 per cent lead valued at Rs. 20.34 crores has been imported against imports of 10,275 tonnes for Rs. 16.73 crores during the same period last year, thereby, showing a phenomenal rise of 26 per cent in the international prices.

However, according to official sources, the rates of non-ferrous metals in the international market fluctuate frequently. Hence it is too soon to estimate the prices until the deal is finally struck.

Also the estimates of the total imports are on conservative basis and do not fully take into account the expected fluctuations in the international prices.

In the case of nickel, about 4,000 5,000 tonnes is estimated to be imported and Rs. 106 crores has been earmarked for the purpose.

However, during the first four months, 1,517 tonnes of nickel valued at Rs. 54.08 crores has been imported compared to import of 1,668 tonnes valued at Rs. 19.63 crores. And if the four months figures are any indication, the prices of nickel in the international market has shot up by 66 per cent.

### DUTY ON ALUMINIUM INGOTS REDUCED

The government has notified reduction in the basic rates of customs duty on aluminium ingots from Rs. 1,000 per tonne to Rs. 500 per tonne.

The reduction in the duty rate has been made keeping in view the current international and domestic prices of aluminium. The duty structure of aluminium and downstream products have also been reduced.

A uniform rate of basic excise duty of 18 per cent ad valorem has been prescribed for both CG and EC grades of unwrought aluminium. The basic excise duty on aluminium waste, scrap, powers and flakes has been increased from 15 per cent to 20 per cent ad valorem. Changes have also been effected in the rate of excise duty on aluminium strip and sheets used for specified purposes according to an official release.

Any Problems In  
TEMPERATURE MEASUREMENT?  
Always Insist on



MERCURY-in-STEEL DIAL  
THERMOMETERS  
BI-METAL DIAL THERMOMETERS  
ASTM/IP STANDARD GLASS  
THERMOMETERS

**M/s. KALIDAS HARJIVAN**

(Estd : 1920)

195, Samuel Street, Bombay-400 009.

Phones : Office : 8555525, 321882 Resl.. 8120548

Grams: MAHUVAWALA



## Major minerals output may fall short of target

A recent official review has shown that the output of several key minerals by the end of the 7th Plan may fall short of the target. As a result, the country's reliance on imports to meet the consequent gap between demand and availability will considerably go up.

This will also mean greater strain on the foreign exchange reserves which are already in a precarious state. The aluminium output target for 1989-90 is set at 4,99,000 tonnes, while anticipated achievement will be 450,000 tonnes according to the review.

Similarly in the case of copper refined, the target is 42,700 tonnes, but the actual output may be around 39,000 tonnes. Zinc output may not exceed 83,000 tonnes as against the target of 89,000 tonnes.

Out of 17 principal minerals, there was substantial fall in the output of seven last year for which the latest figures are available as compared to 1986. Production of five minerals was only marginally higher.

The production of gold fell from 1,931 kg. in 1986 to 1,864 kg. in 1987. Chromite output fell from 630,000 tonnes to 624,000 tonnes.

Similarly manganese ore production fell from 12,84,000 tonnes to 12,75,000 tonnes, barytes from 3,37,000 tonnes to 2,12,000 tonnes, dolomite from 22,00,000 tonnes to 21,78,000 tonnes, magnesite from 4,60,000 tonnes to 4,20,000 tonnes and steatite from 3,79,000 tonnes to 3,59,000 tonnes.

Production of the following metals was only marginally higher: Lead concentrate from 44,000 tonnes to 47,000 tonnes, zinc concentrate from 90,000 tonnes to 105,000 tonnes, apatite and phosphorite from 6,67,000 tonnes to 6,79,000 tonnes.

Asbestos production in both the years was 27,000 tonnes, iron ore output marginally improved from 48.8 million tonnes to 49.4 million tonnes.

Production targets may, however, be attained in iron ore and lead. The 1989-90 target for iron ore and

concentrate is 58.1 million tonnes and for lead 27,000 tonnes.

### INDUSTRY HAILS NEW STATE POLICY

Trade and industry circles have welcomed the Maharashtra government's new industrial policy offering a range of incentives giving a new thrust to the process of industrialisation of the state.

The Bombay Chamber of Commerce president, Mr. K. R. V. Subramaniam, said while the plan to develop 64 growth centres in the coming years was laudable, the chamber suggested that it would be advisable to develop one or two model growth centres with all social and economic infrastructure initially in Vidarbha, Marathwada and Konkan areas to serve as examples for the creation of similar centres in other areas of the state.

The industry would be ready to

cooperate in the formulation of such model growth centres, the chamber president said.

The creation of a ministry of textiles at the state level is very appropriate and timely as the restoration of the health of this industry.

The chamber hopes that to accelerate the pace of industrialisation, the incentives announced for expansion and diversification will also be available to larger industrial units including those in group A area.

The Confederation of Engineering Industry (CEI) said that it would look forward to proper implementation of the policy for accelerated growth of industries in the state.

CEI felt, however, that the policy should have provided for solving specific problems of industrial units in metropolitan areas in need of modernisation.

The All India Association of Industries said the new policy would provide the much-needed impetus to the industrial growth of Maharashtra.

## may we serve you?

For International Standard Laboratory & Analytical Reagents:

For your bulk raw material/requirements, etc. of

ACETATE • BORATE • BROMIDE • CARBONATE  
CHLORIDE • CHROMATE • FLUORIDE • HYDROXIDE  
NITRATE • OXIDE • SULPHATE • TARTRATE • ETC.

or

BARIUM • BISMUTH • CADMIUM • CHROMIUM  
COBALT • COPPER • LITHIUM • LEAD  
MAGNESIUM • MANGANESE • NICKEL  
POTASSIUM • SODIUM • STANNOUS (TN-II) • STRONTIUM

& OTHER INORGANIC CHEMICALS

IN SK Pure, SK LR, SK AR

(or as per your specification)

Contact Manufacturers:

**S.K. CHEMICAL INDUSTRIES**

57/61, CHAKALA STREET, BOMBAY-400 003  
GRAM: MAGSALTS, BOMBAY-9.

PHONE: 33 73 80

ASSOCIATE CONCERN: SHREE ADINATH CORPORATION BOMBAY 400009.



New Office Address: 213, Narshi Natha Street,  
1st Floor, Bombay-400 009. Tel: 8512932/8512933, 302123



## New package to boost exports

The Union Government has approved a package of measures to help the country achieve higher exports during the current financial year, the target for which has been revised upwards to Rs. 18,795 crores. This signifies a 19.6 per cent growth in dollar terms over the performance in 1987-88.

The package includes reduction in import duty on a variety of raw materials needed for the thrust export sectors, removal of freight-related problems, availability of more raw materials at international prices and relaxation of monetary restrictions on the gems and jewellery sector.

The measures are contained in a short-term strategy paper prepared by the Commerce Ministry, which was discussed and approved at the meeting of the Cabinet Committee on Exports, held under the chairmanship of the Prime Minister, Mr. Rajiv Gandhi, on August 2. The meeting was attended, among others, by the Commerce Minister, Mr. Dinesh Singh.

In order to achieve the overall export target, it has now been decided to earmark the entire prodn. of alumina and aluminium by the National Aluminium Co. for exports during '88-89. It has also been decided that the problems of competitiveness arising out of high freight and port charges in the minerals sector would be resolved so as to ensure additional exports in these sectors, which have been facing difficult export prospects in recent years, especially in iron ore because of the depressed world market.

The package includes reduction of import duty on PU foil/film and on thermoplastic rubber materials used for the manufacture of TPR soles for boosting exports of leather and leather manufactures. It has also been decided that supply of raw materials like HR coils, pig iron and billets to the engineering exporters would be ensured.

It has been decided that availability of adequate funds under the International Price Reimbursement Scheme (IPRS) would be ensured through an appropriate mechanism

like alternative sources of funding. Permission to import second-hand building drums and presses will also be granted to step up exports of automotive tyres.

Another measure, approved by the committee, pertains to reduction in import duty on automatic glove-making plants and ceramic moulds to take advantage of favourable trends in the international market for rubber surgical gloves for making an export thrust.

In addition, it has been decided that public sector units such as the Indian Oil Corporation and Hindustan Organic Chemicals would be directed to supply chemical raw materials and intermediates needed by exporters of drugs and pharmaceuticals, dyes and dye intermediates, organic and inorganic chemicals, agro-chemicals and plastics at international prices against surrender of advance licences.

These measures have been evolved on the basis of surveys of prospects for raising exports in different sectors after taking into account the domestic production, particularly in the context of the drought, growth in export surpluses, nature of competition faced by the products abroad and the trends of world demand.

While the effort has been to concentrate on maximising exports in all sectors, the main areas, which are expected to show substantial growth during the current year are engineering goods, chemicals and related products, leather manufactures and gems and jewellery.

Accordingly, the targets for these sectors have been revised upwards. The revised targets are Rs. 2,000 crores for engineering goods, Rs. 1,900 crores for chemicals and related products, Rs. 1,500 crores for leather manufactures and Rs. 4,000 crores for gems and jewellery. The growth projected for these sectors works out to 39.6 per cent, 48.4 per cent, 31.7 per cent and 53.1 per cent respectively.

The export strategy underlying these measures has three broad ob-

jectives. These are: accelerating production in the export-oriented sectors and simultaneously increasing exportable surplus, exercising selective restraints on domestic consumption and to the extent necessary providing capital goods, raw materials and components at world prices for export production as a general principle, and to accord priority to export demands in the area of infrastructure, namely power, transportation, port and telecommunications.

Such a three-pronged strategy is considered necessary if a quantum jump in exports has to be achieved to raise the share of exports in the gross national product from the existing level of 4.5 per cent to 10 per cent.

---

### NEW MAHARASHTRA POLICY AIMS AT SPREADING INDUSTRIAL ACTIVITY

---

The Maharashtra Government has announced a new industrial location policy whereby units which are set up farthest from Bombay would get greater incentives than those which are nearer the overcrowded metropolis.

Further, the five year new package has such incentives which are "better than those which are prevalent in the neighbouring States" of Gujarat, Andhra Pradesh, Madhya Pradesh and Karnataka" which according to Chief Minister Mr. Sharad Pawar, would attract enterprises from outside.

Mr. Pawar announced to presspersons that this distance criterion would enable spread of industries to the backward regions for long neglected and if industrial enterprises assure and demonstrate that 80 per cent of the non-technical jobs would be given to locals then incentives would be more.

Though details are yet to be worked out, the Maharashtra Government has a proposal to give greater incentives to those industries which are located within Bombay, Thane-Belapur region but would like to migrate to other places.



## Company News

### TAC TO DIVERSIFY

Tuticorin Alkali Chemicals & Fertilisers Limited (TAC) is to diversify into low investment and high return areas, such as pesticides and detergents. According to the company's vice-chairman and president, Mr. C. V. S. Mani, this step would not only help in fuller utilisation of the company's marketing network but would also enable it to improve its profitability which has been under strain ever since commencement of operations in 1982.

As a first step ATC has recently acquired Sterling Pesticides Limited, a small-scale insecticides unit at Tiruchirapally, through outright purchase. The company now hopes to market such chemical formulations in a big way in the Tanjore, Tiruchirapally and Madurai districts of Tamil Nadu where it already has a well-developed agricultural inputs delivery network. According to Mr. Mani, the company — which has 450 acres of land under salt pans at Tuticorin — has recently taken up the marketing of iodised salt through distributors. Though TAC has entered the field with a modest production of 5,000 tonnes of iodised salt per annum, there was good scope for the company to expand in this market where the annual demand was in excess of 52 lakh tonnes. At present the total production of iodised salt in the country was only around 14 lakh tonnes a year.

On prospects for the financial revival of the joint sector company which has accumulated losses amounting to Rs. 5 crores so far, Mr. Mani said that financial institutions had already

cleared a Rs. 6 crore rehabilitation package. Consequently, the company was now implementing schemes that would enable it to achieve additional production of 10,000 tonnes each of soda ash and ammonium chloride annually as well as give it a captive power generation capacity thus enabling it to tide over problems of power cuts.

TAC, which has been jointly promoted by the Tamil Nadu Industrial Development Corporation and Southern Petrochemicals Industries Corporation (SPIC), presently has a licenced capacity to produce 66,000 tonnes each of soda ash and ammonium chloride per annum.

The Centre's decision to place ammonium chloride under the

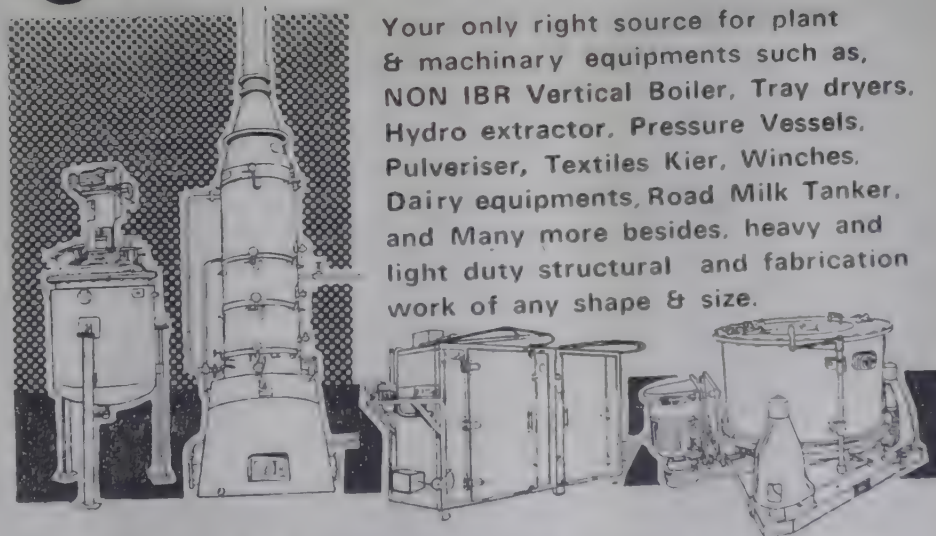
retention price scheme had helped the company turn the corner and report its first ever profit of Rs. 4.06 crores in 1987, Mr. Mani said. The company's turnover during the 12-month period ended December 31, 1987 was Rs. 39.01 crores as against a turnover of Rs. 48.43 crores for the 18-month period ended December 31, 1986.

### UNION CARBIDE

The shareholders of Union Carbide India Limited (UCIL) passed a special resolution altering the memorandum of association of the company paving the way for it to diversify at the annual general meeting held at Calcutta recently.

According to chairman-cum-managing director V.P. Gokhale, the need for diversi-

**COME AND BE A  
SUCCESSFUL ENTERPREUNER WITH US.**



Your only right source for plant & machinery equipments such as, NON IBR Vertical Boiler, Tray dryers, Hydro extractor, Pressure Vessels, Pulveriser, Textiles Kier, Winches, Dairy equipments, Road Milk Tanker, and Many more besides, heavy and light duty structural and fabrication work of any shape & size.



**DO DROP A LINE OR CALL US.**

**DESIGNERS &  
FABRICATORS**

C-1/12, G. I. D. C. ESTATE, OPP. : AMBICA NAGAR SOCIETY,  
ODHAV, AHMEDABAD-382 415. PHONE : O. 887614

**LET OUR EQUIPMENTS PLAY A SMALL ROLL  
IN YOUR GREAT-SUCCESS.**



fication had become necessary due to the saturation in the dry battery market. While demand in the home market has remained static at 1985 levels, he said the export market was declining as most countries had sufficient indigenous capacity for battery manufacture.

Referring to the company's performance during 1987, Mr. Gokhale said a major concern was the closed Chembur chemicals and plastics plant, which was incurring a loss of Rs. 50 lakhs per month.

He mentioned that since public sector organisations had not shown any interest in acquiring the plant, the company was hopeful of securing Union government approval to sell the plant to a private sector organisation.

It was contemplated that under such a transaction, the buyer will continue the services of all current employees of the Chembur unit on the existing terms and conditions of service.

Mr. Gokhale said UCIL had received various offers in this regard but with a view to offering an opportunity to other organisations with necessary financial and managerial capabilities to bid for the plant, the board had decided to extend the last day for receipt of offers to August 25, 1988.

During 1987, the company's income was Rs. 200.96 crores compared to Rs. 217.45 crores in 1986. Profit before tax was Rs. 7.25 crores (Rs. 9.01 crores in 1986) and profit after tax Rs. 4.75 crores (Rs. 5.01 crores). The company paid a dividend of 12 per cent, the same as the previous year.

## TWO SHORTLISTED FOR SHALIMAR PAINTS TAKEOVER

Courtaulds is understood to have shortlisted two prospective buyers for the Calcutta-based Shalimar Paints Limited, in which it has a 32 per cent stake

through its subsidiary, International Paints PLC.

The two parties, according to informed sources, are ICI of UK, the Indian outfit of which is IEL Limited, and industrialist Vijay Mallya of United Breweries. In all, around six industrial groups, almost all of them based in this part of the country, are known to have bid for Shalimar Paints.

Both the groups shortlisted by Courtaulds, already have a presence in the paint industry in India, Mr. Mallya in the form of a controlling interest in the Calcutta-based Berger Paints and IEL in its paints division at Rishra.

With the acquisition of Shalimar Paints, which reported a turnover of slightly less than Rs. 60 crores last year, either of these two groups could become number two in the industry overtaking the current number two, Goodlass Nerolac (turnover approximately Rs. 104 crores).

Courtaulds, it appears, is keen to dispose off Shalimar Paints to either of these parties as the foreign exchange transfers would be smoother.

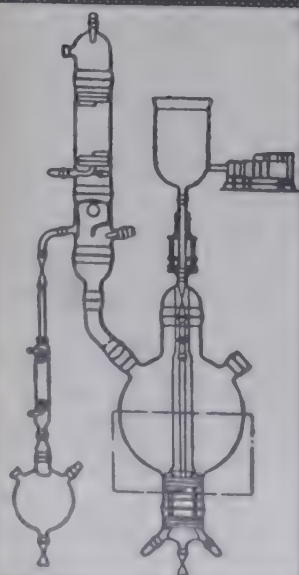
## CHEMOX CHEMICAL

Chemox Chemical Industries has recommended a maiden dividend of six per cent on the enlarged capital on prorata basis for the year ended March 1988. The company has fared well.

The turnover is up by 33 per cent to Rs. 769.16 lakhs from Rs. 577.91 lakhs in the previous year. The gross profit has more than doubled to Rs. 7.46 lakhs from Rs. 3.06 lakhs last year.

The net profit has risen substantially to Rs. 4.12 lakhs from Rs. 1.45 lakhs after depreciation (Rs. 0.33 lakh against Rs. 0.05 lakh), taxation (Rs. three lakhs against Rs. 1.55 lakhs) and writing off the preliminary and other expenses (Rs. 0.01 lakh against the same).

## MANUFACTURERS OF INDUSTRIAL & LABORATORIES GLASSWARES



### Specialists in :-

- 10 L To 200 L ALL GLASS REACTION & DISTILLATION UNITS
- H.C.L. ABSORBERS UP TO 12" DIAMETER
- GLASS HEAT EXCHANGERS, COLUMNS, BENDS REDUCERS, REFLUXATION HEADS UP TO 12" DIAMETER
- TEFLON VALVES & GLASS STOP COCKS
- COMPLETE STRUCTURE ERECTION & INSTALLATION OF GLASS UNITS
- LABORATORY INTERCHANGEABLE GLASS APPARATUS
- OIL BATH & WATER BATH WITH LEAK PROOF
- BOTTOM SEAL ARRANGEMENTS
- CENTRIFUGAL PUMPS



## GARG LAB GLASS INDUSTRIES

Bombay Office.

19, ANAND BHAWAN, 2ND FLOOR 17 BABU GENU ROAD PRINCESS STREET, BOMBAY-400 002  
PHONE: 319579 CABLE: "GARGGLASS" (VAPI)

### Factory:

1, CIB TYPE, GIDC, VAPI-396 195 DIST VALSAD (GUJARAT) PHONE 765 - RES 863

WANTED STOCKISTS & REPRESENTATIVES

PRINT-DESIGN



FOR YOUR REQUIREMENTS OF

## SODIUM LAURYL SULPHATE

30% LIQUID & 90% POWDER

## SODIUM LAURYL ETHER SULPHATE

30% LIQUID

TOOTHPASTE, COSMETIC, PHARMACEUTICALS  
& DETERGENT INDUSTRIES

CONTACT MANUFACTURERS

## INTERMEDIATES & CHEMICALS

S-77/1, M.I.D.C., BHOSARI, PUNE - 411 026  
PHONE: 87476

For Your Bulk Requirements Of:

- |                           |   |  |
|---------------------------|---|--|
| 1) FATTY ACIDS            | : | Oleic, Recenolic, Linoleinic, Linseed Oil, Fatty Acid & Coconut Fatty Acid.  |
| 2) METALLIC STEARATES     | : | Lead, Calcium, Barium, Cadmium, Zinc, Aluminium etc.   |
| 3) PVC STABILISERS        | : | <b>Solid:</b> TBLS, DBLS, DBLP, LS, CS & Package Stabilisers for Rigid PVC Pipes & cable Industries<br><b>Liquid:</b> Barium, Cadmium, Liquid Stabilisers i.e. BCP 986, BC 026, Chelators. |
| 4) ORGANO TIN STABILISERS | : | Toxic, Non-Toxic & Non-Sulphur   |

Kindly Contact Manufacturers:

## M.G. CHEMICALS & OXIDES

Regd. Office: A-10/3, Indrayuda Housing Society, M.G. Road, Goregaon (W), Bombay 400 090.

Phones: 697514, 6722018

Admn. Office: G-42, D-Wing, Dewan Apts. No. II, Navghar, Vasai Road (East), Thane.  
Vasai Phone: 944.

FOR YOUR REQUIREMENTS OF:

EDTA DISODIUM SALT  
AMMONIUM THIOCYANATE  
POTASSIUM THIOCYANATE  
SODIUM THIOCYANATE  
AMMONIUM CARBONATE  
ZINC POLY PHOSPHATE  
LEAD ACETATE  
BROMO BENZENE

**GLYCINE USP/BP**  
(Amino Acetic Acid)

**CALAMINE IP/BP**  
(MFG. FREZCO CORPORATION)

AMMONIUM BROMIDE  
GLYCINE (Pure)  
ACETAMIDE  
ZINC CARBONATE  
SODIUM BROMIDE  
COPPER SULPHATE  
HIPURIC ACID  
LEAD NITRATE

## ETHYLENE THIO UREA -- NA 22

PLEASE CONTACT

## M/s. PASCO TRADERS

A. 18, Jay View Co-op Hsg. Society, Dhake Colony, Andheri (W), Bombay 400 058  
Phone: Offl: 6322847; Resl: 6493549



# Spotlight on Biotechnology & Life Sciences (Part II)

## A New Genetically Engineered Nitrogen Fixing Soil Bacteria Under Field Trial

Biotechnica International has started field tests with its genetically engineered nitrogen-fixing soil bacterium *Rhizobium meliloti* on ninety alfalfa test plots at its Chippewa agricultural station. In greenhouse trials the gene-spliced strain increased yields of alfalfa according to Dr. David Glass, vice-president of government and regulatory affairs for Biotechnica Agriculture.

USA grows about 25.5 million acres/year of alfalfa producing a total crop worth \$7 billion. Conventional strains of rhizobia are used on about 80% of this crop. Because the crop is not in a surplus situation and growers receive a premium price for good quality alfalfa, an increase in yield provided by a competitively priced seed inoculant can mean more profit for growers. This is another example of the contribution of biotechnology (via genetic engineering) for boosting agriculture's profitability.

Biotechnica hopes to win government's approval later in 1988 for gene-spliced rhizobia strains specific to nitrogen fixation in soya bean. Company scientists are also working to engineer herbicide, disease and insect resistance in maize, soya beans, wheat and alfalfa. (ECN 5/2/88 p. 17)

## The World's First Ever Transfer Of A Foreign Gene Into Maize

Plant scientists at Sandoz Crop Protection Corp. in Palo Alto, California have successfully managed to transfer a foreign

gene into maize plants. This is a new landmark in agricultural biotechnology. Transferring genes that make plants resistant to pests, herbicides and diseases is one of the key targets for agricultural biotechnology. While this has been accomplished in dicotyledonous plants such as tobacco and tomato, the transfer of genes into commercially important monocotyledons, such as cereals has not now proved elusive.

The genetic transformation of dicots is accomplished by smuggling the target gene into the plant using the bacterium *Agrobacterium tumefaciens*. This technique cannot be employed on cereal crops because these plants are not as susceptible to infection by the bacterium. Sandoz researchers have adopted, however, a different novel approach. They report using protoplasts, plant cells stripped of their cell walls to translate the genes. These protoplasts are subjected to an electric current which produces holes in the membrane to allow the passage of the desired genes present in the growth medium into the cell.

The Sandoz research team then grew these protoplasts with a nurse culture of Black Mexican Sweet Maize Cell suspension. As a marker, researchers used a gene that eventually provides resistance to the antibiotic kanamycin. The researchers managed to grow plants from these cells that were resistant to the antibiotic indicating successful transfer of the genes.

But as the scientists report, all the regenerated plants were sterile and now the team is striv-

ing to regenerate fertile plants from such transformed cultures. Carol Rhodes, the chief researcher, believes that the reason the plants regenerated on the experiment did not seed is more to do with the cell line than the method.

"These cultures are now over two years old and it is not unusual for maize cell cultures of this age to carry genetic changes serious enough to cause sterility" explains Rhodes. The Sandoz team also has further information indicating that the technique can be used with other maize strains and cell cultures. (Science 240, pp 204-207)

## A New Lipase Enzyme For Production Of High Purity Monoglycerides Developed

The enzyme *Penicillium Lipase C* is a new lipase enzyme developed by Biocatalyst Ltd. (UK) for the production of high purity monoglycerides. This enzyme offers a simpler and more cost-effective alternative to chemical synthesis.

Enzymes are highly specific in their catalytic action and therefore offer benefits over chemical methods of synthesis. Very little diglyceride is formed during synthesis with this enzyme, thus producing cost savings in the subsequent purification stages.

Other uses of lipases as catalyst in chemical synthesis include both flavour and pharmaceutical production.

*Penicillium Lipase C*, purified from *Penicillium cyclopium* demonstrates high specificity against monoglycerides with a pH optimum of 5.0 and temperature



Optimum at 40°C. The enzyme is stable for 6 months. (Food Manuf. 1/1988 p. 17)

### Guide & Dictionary On Fermented Foods Consumed Worldwide

A guide and perhaps the world's first dictionary listing fermented foods consumed worldwide has been recently published by Butterworth (1987) under the title: "Fermented Foods of the World: A Dictionary & Guide".

The author C. G. Campbell Platt, whose interest in fermented foods began when he taught at the University of Ghana, has completed a dictionary of over 1,500 foods, classified into 250 groups. He has divided fermented foods into nine major classes: beverages, cereals, dairy products, fish, meat, starch crops, fruits/vegetables, legumes and miscellaneous products.

Information is given on the areas in which the fermented foods occur in the world, production techniques, microbiological and biochemical characteristics, composition and nutritive value. Names of foodstuffs are cross referenced throughout. At the end of the dictionary, the foods are listed alphabetically, both by region of production and by class.

By the very nature and its pioneer endeavour, such a book is bound to be uneven in the amount of information given for individual foods and the author admits the list is far from complete. It is nevertheless a significant and unique reference source and should prove extremely useful to all those interested in the wide diversity of fermented foods. (Food Manuf. 1/1988, p. 16)

### Novo Publishes An Informative Handbook On Practical Biotechnology

Novo Industry (Denmark) has recently published an informative handbook under the title: "Hand-

book of Practical Biotechnology". This handbook besides covering interesting aspects in practical biotechnology, gives an excellent review of the role of enzymes in food processing. The Table 1 below covers major applications of enzymes in food technology.

Table 1: Enzyme Applications In Foods & Food Processing

Industry	Applications
Baking	Dough conditioning Flour bleaching Flour malting Anti-staling
Brewing	Low calorie beer Chill-proofing Barley brewing Alternative adjunct liquefaction and saccharification
Dairy	Cheese making Accelerated cheese ripening Natural cheese flavour concentrates Whey utilization Lactose intolerance reduction
Fruit Juice	Mash treatment Depectinization Starch/Araban haze removal Citrus pulp wash viscosity reduction
Starch	High fructose corn syrup (HFCS) Maltose syrups Dextrin syrups Dextrose
Protein	Rendering Soy milk production Egg white replacers Emulsifier production Functional hydrolysates
Fats & Oils	Cocoa butter substitutes Flavour ester synthesis Speciality fats for better nutrition
Pet Foods	Sprayable digests Palatability enhancement Improving extruder performance
Miscellaneous	Meat tenderizing Coffee-soluble extract Viscosity reduction



FOR YOUR  
REQUIREMENTS OF

POTASSIUM IODIDE  
IP/BP/USP/AR

POTASSIUM IODATE

SODIUM IODIDE IP/BP

DI-iodohydroxy

QUINOLINE IP

CHLORAMPHENICOL IP

METRONIDAZOLE

BENZOATE IP

FERROUS FUMARATE

IP/BP

SACCHARIN SODIUM IP

SODIUM CITRATE IP

SODIUM POTASSIUM

TARTARATE

DISODIUM HYDROGEN

CITRATE BP

PIPERAZINE

CITRATE IP

CAFFEINE CITRATE IP

Contact Manufacturers

## LUB-CUT INCORPORATION

B/8, Nand Dham,  
Marol Maroshi Road,  
Andheri (East),  
Bombay 400 059

HELLO: 634 4776

634 5510

TELEX 011-7610 ARCEP

**A NEW NAME**  
TO MEET YOUR REQUIREMENTS OF  
SEQUESTERING / CHELATING AGENTS

# EDTA

EDTA PURE ACID

EDTA DI SODIUM

EDTA TETRA SODIUM EDTA FERRIC AMMONIUM

EDTA TETRA SOLUTION

EDTA-FERRIC SODIUM

MICRONUTRIENTS -- Zn, Fe, Cu & Mn EDTA

Contact Manufacturers:

*New Alliance Dye Chem. Pvt. Ltd.*

Office:

214, Bazar Ward, Kurla West,  
Bombay 400 070.

Phones: 5123983-5112465



Factory:

K-63, M.I.D.C. Tarapur,  
Post-Boisar, Dt. Thane

Pin: 401506

For Your Ready Requirements Of:

POLYETHYLENE WAX OF LOW DENSITY  
(HYDROCARBON WAX)

EMULSIFIABLE WAX \* PIGMENTS FOR PVC CABLE  
& PE CABLE

OTHER WAXES \* STEARIC ACID (ALL GRADES),  
GLYCERINE CP/1W \* PVC STABILIZERS

TBLS \* DBLS \* LEAD STEARATE

DBL PHOSPHATE \* DBL PHTHALATE

CALCIUM STEARATE \* ZINC STEARATE

OTHER METALLIC STEARATES

SPECIALITY IN PVC CABLES, RIGID PIPE AND  
TEXTILE AUXILIARIES

Please Contact:

Mr. PARIMAL MEHTA

**ARPEE ENTERPRISES**

Shop No. 10, K. P. Nivas, Dr. B. Ambedkar Road, Matunga C.R.,  
Bombay 400 019.

Phone: 412 63 84



FOR BETTER QUALITY  
& RELIABLE SERVICE

WHITE  
PRINTING GUMS

Rosaline RD  
2% Paste for procian &  
Rapid Fast colour printing

Rosaline NAH/250

2.5% Paste for procian  
colour printing.

Rosaline NBV

4% Paste for Procian  
colour printing.

Rosaline PA/30

7% Paste for Hot procian &  
Acid colour printing.

Rosaline PA/30/LV

10% Paste for Acid Procian  
colour printing.

YELLOW  
PRINTING GUMS

Rosaline TX

3.5% Paste for Rapid fast  
& Indigosol Dyes.

Rosaline AG

5% Paste for procian  
colour printing.

Rosaline AGBV.

8% Paste for Acid Procian  
colour printing

Rosaline-500

Sodium Algenati Substitute

SIZING FINISHING  
GROUPS

Rosaline SG

For Sizing purpose.

Rosaline FG

For Finishing purpose.

Rosaline PG

For Paper Industrie.

Rosaline REPOL

C.M.C. For Detergent paint.  
Food & Textiles Industries.

Rosaline GG

Pure Grade Gum Powder For  
Food Industries

ROSALINE GAYATRI  
GUM  
INDUSTRIES

Office 4, Hiral Shopping Centre  
Bhattha, Paldi.  
Post Box No 12019  
AHMEDABAD-380 007 (INDIA)  
Tele. O: 41 87 76 R: 41 47 51  
GRAM ROSALINE

KNS ADI

Available Directly From Manufacturers

EDTA / NTA & its Salts

DTPA -- Na<sub>5</sub>

FERRIC SODIUM EDTA (Pharma/Photo Grades)

FERROUS FUMARATE I.P.

Agrochemicals

CHELATED ZINC - Min. 12% As Zn

CHELATED IRON - Min. 12% As Fe

Note:

Our products can replace Metaclaw/Chelashok/  
Acinol/Superquest/Sequesterene/Trilon/Versene  
Brand Sequestering Agents.



AVA CHEMICALS PVT. LTD.

3/5B, Jerome Estate, Opp. Inkokem Ltd.,  
Jeri-Mari, Kurla Andheri Road, Bombay 400 072

Phones: 5123272/5136822/5126821

Gram: NEW GENER

Telex: 011-72398 SOC IN

We Supply In Bulk & Small Packing At Most Competitive Prices

SULPHURIC ACID - 70%

(Textile Grade - For Carbonising)

SULPHURIC ACID - 96-98%

HYDROFLUORIC ACID - 60%

NITRIC ACID - 60 - 70 - 98%

ACETIC ACID - 70 - 98%

PHOSPHORIC ACID - 80 - 85%

HYDROCHLORIC ACID - 30 - 32%

OLEUM - 20%

LIQUOR AMMONIA

(Sp. Gr. 0.910 & 0.888)

FERROUS SULPHATE (Tech.)

In Commercial, C.P. and A.R. Grades

UNION ACID & CHEMICAL CO.

Head Office: 151 B, Mittal Court.

Nariman Point Post Box No 11539.

Bombay 400 021

Phones: 242325/4030/4075

224178/3222-5938

Telegram: "UNIONACID"

Branch Office

Agre Mal 1, Agre Road

Kurla, Box No 10001

Phone: 242325/4030/4075



Enzymes are natural versatile catalysts. The food industry has taken advantage of their capability to increase product yields and increase byproducts and reduce energy costs.

Biochemists formally classify enzymes into 6 categories according to the reaction catalyzed :-

- Oxidation/reduction
- ligation
- Hydrolysing
- Transfer reactions
- Isomerizations and
- Reactions in which they are additives to double bonds.

The use of enzymes in food processing has greatly expanded in recent years (refer Table 1 in p. 75) and cover the following significant objectives: (a) reduce viscosity, (b) improve extraction, (c) carry out bioconversions, (d) enhance separations, (e) develop functionality, (f) create or intensify flavour and (g) synthesize novel chemicals via fermentation.

Most of the industrial enzymes used today in the food industry fall into hydrolytic category. These enzymes characteristically depolymerize their substrates into smaller oligomers and/or monomers. Examples include; proteases that break proteins into peptides and/or amino acids, amylases that hydrolyze starch to dextrans and simple sugars like maltose or glucose and lipases that split fatty acids off triglycerides.

Enzymes have contributed greatly to the development of novel foods, fast foods, packaged food products with long shelf-life in affluent countries like America, Japan & Western Europe. In contrast, the foods in the third world countries are drab with practically little or no development of novel foods from local food resource. Food enzymes have also

played an important role in developing a range of packaged foods based on soyabeans in affluent countries particularly in Japan and USA.

(Nova's Handbook of Practical Biotechnology,

For a free copy, contact:  
Novo Laboratories Inc.,  
33, Turner Road, Dept. CEP,  
Danbury, CT. 06810, USA.)

### Unilever Unveils Dynamic Plans for Biotech Research On Seed Improvement

Unilever (UK) has recently unveiled some of its plans for the plant breeding and seedmarketing organization it bought recently from the UK government last year for \$123 million. The new Plant Breeding International (Cambridge, UK) will continue with its breeding programmes for wheat, barely, potatoes, oilseeds and pulses and will eventually be expanding its crop portfolio.

The Company's research policy will focus on improving yields, quality, and disease resistance and will aim to serve the end-user sectors, such as the food industry. Unilever scientists have been asked to focus on improved fatty acid profiles in the oil seed crops. This research therefore should have particular significance for India (the world's largest importer of edible oils). Unilever is also investing in biotechnology in a big way.

Unilever's interest in the seeds sector is, however different from that of the chemical industry. The company will focus on the genetic improvement of the raw materials of the food industry. In contrast, chemical companies are interested in the sector because it will support their agrochemical business. (ECN, 5/9.88, p. 23)

### The World's First Patent For A Genetically Engineered Animal

A genetically engineered mouse has shaken the foundation of biotechnology in the US by earning the world's first patent for a genetically engineered animal. The USA government's Patent & Trade Mark Office last April issued the patent to Harvard University and two of the university's scientists Philip Leder and Timothy Stewart. Du Pont which has funded Leder's research since 1981, has an exclusive licence to breed the mice commercially.

The patent is broad covering any "non-human eukaryotic (having nucleated cells)" into which scientists plant an active oncogene (a cancer causing gene) or a sequence of DNA that induces cancer in the animal and its offspring. Leder and Stewart created a 'transgenic' animal, a mouse that carries the oncogene c-myc in both its result, the mouse cells. As a result, the mouse and its offspring are genetically predisposed to breast cancer. Harvard has deposited the plasmid, or genetic vector carrying the oncogene with the American Type Culture Collection.

Such mice are valuable to researchers for testing the potency of carcinogens or substances that combat cancer and as cell bank for cancer research. Harvard's mice will succumb to carcinogens at lower doses more commonly found in nature.

Researchers at the USDA, are experimenting with several transgenic animals, e.g. they have developed a genetically engineered chicken that is resistant to avian leukosis virus. Another application to the patent office by Integrated Genetics (Massachusetts, USA) covers engineered rodents



at secrete a therapeutic protein, tissue plasminogen activator, in the milk of lactating females. The company has also applied for patents in Europe. (New Sc., 12/21/88, p. 23)

### New Bacteria Identified For Soil Clean Up

Microorganisms have successfully cleaned up about 4000 cu. ft. of diesel and gasoline contaminated soil in a project undertaken by Biota (Los Angeles), an environmental consulting firm that specializes in the use of microbes. Employing bacteria saved an unidentified client about 75% in costs, compared with the alternative of shipping the contaminated dirt to a landfill. The project was unusual in terms of its size and it took about 3-1/2 months to reduce contaminant levels to those that are significantly lower than the legal requirement.

The site was a non-operational Los Angeles distribution and trucking facility where soil had been contaminated by leaking underground fuel tanks. After the tanks were removed, the soil was excavated and the hydrocarbons were degraded by two naturally occurring bacteria *Pseudomonas pseudomallei* and *Serratia liquefaciens*. Potassium nitrate was added to the soil, which had virtually no nitrogen. Phosphate buffers were also added to stabilize the pH.

In another project, with Hercules, Biota is planning to use bacteria to clean up soil residues of trinitrotoluene and dinitrobenzene. The researchers have identified five different species to successfully clean-up the above soil residues. These species include three different *Pseudomonas* species, one species of *Aero-*

*monas* and one species of *Enterobacter*. (Chem. Wk., 5/4/88, p. 43)

### European Corn Borer In Corn To Be Eradicated By Genetically Engineered Micro-organisms

The first field trials in USA of a genetically-engineered micro-organism is expected to take place in Maryland in the spring of 1988. The organism combats the European corn borer — an insect that damages corn worth \$400 million in the USA alone. The French National Agricultural Research Centre is also considering proposals for trials of the same organisms.

Crop Genetics International (CGI), the company that engineered the organism hopes to market it by 1991. The well-known environmentalist Jeremy Rifkin, however, reports that the organism could constitute a hazard to the environment.

CGI re-engineered the microbe *Clavibacter xyli* *cynodontis* (Cxc) to include a gene from *Bacillus thuringiensis* (Bt.). The gene codes for Kurstaki, an insecticidal endotoxin that interferes with the digestive systems of caterpillars including the European corn borer.

Trials in greenhouses show that Cxc the parent bacteria, will colonize corn. Rifkin reports that the parent bacteria threatens the environment because it will also colonize 83 other plant species.

Last April, the Hazard Evaluation Division of the US's EPA issued a permit for CGI to do small scale field trials. This, however, is not a formal approval. The EPA will wait for public comments and a review of the report by academic experts.

Before giving approval for tests, the EPA considers whether

the organisms constitute a threat to people or to other organisms and whether it is likely to persist in the environment. There will be limited human exposing in these trials. The plants will be burnt after the trial and Cxc is pretty fastidious. It cannot grow at the human body temperature. Further, before the EPA reaches a final decision, geneticists will study the length of time that the gene stays in Cxc. (New Sc., 4/7/88, p. 18).

### A New Cotton Hybridization Technology Developed

American Cyanamid Co. has purchased Piewalt Corporation's cotton hybridization technology and established Chembred Inc. in Arizona to develop it.

The technology offers both near term potential for significantly higher cotton yields and longer range potential for the introduction of genetically engineered traits into cotton and other crops.

Field evaluations have shown a minimum of 10 to 12% higher cotton yields and excellent seedling vigour in the hybrid plants reports Chemred researchers.

Conventional approaches to developing hybrid cotton have been largely unsuccessful because of the nature of the plant. The Chembred hybridizing agent (CHA) renders the male part of the cotton plant sterile, thereby allowing the plant to be pollinated by other non-CHA treated plants nearby. "Widely varying selection opportunities with the Chembred system also make plant breeding for specific market areas quite promising" reports Dr. Denis Ciarlante, associate director of new product development in Cyanamid's Agricultural Research Division. (CMR, 12/21/87, p. 49)



Manufacturers of:

- Benzoyl Peroxide  
(Powder & Paste form)
- Methyl Ethyl  
Ketone Peroxide
- Tertiary Butyl  
Hydro Peroxide

- Lauroyl Peroxide
- Tertiary Butyl  
Per Benzoate
- Di-Tertiary Butyl  
Peroxide
- Cyclohexanone  
Peroxide

**Five Stars**

ENGG. 103, Narayan Dhuru Street, 3rd Floor, Bombay-400 003  
☎ 329209, 329313. Telex: 11-73341 VMKA IN

**TESTWELL**

**GLASS ASSEMBLY**  
for

**LABORATORIES  
CHEMICAL INDUSTRIES**

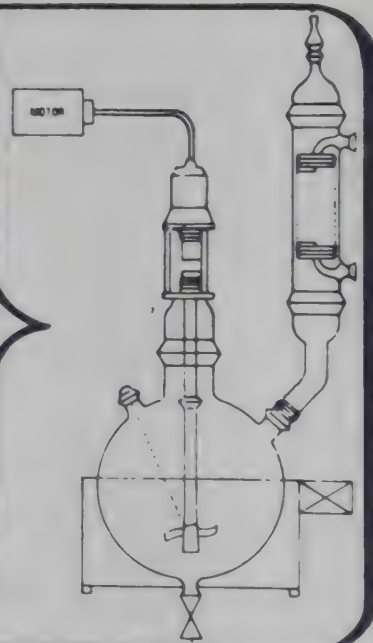
- 20 To 200 Ltr. Distillation Units
- HCL Absorbers Heat Exchangers
- Laboratory Glassware & Quartz Glassware
- we Also Mfr. Laboratory Instruments
- Commitment to Quality & Service

**Hindustan Apparatus Mfg. Co.**

MASKATI MAHAL, 1ST FLOOR

119, K. M. SHARMA MARG BOMBAY 400 002

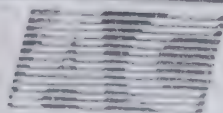
PHONE : 316107 • FACTORY : 4922961



# POTASSIUM NITRATE

You name the specification, we have it.

Contact



**Akshay Chemicals**

205, Kashyap Complex, Jetalpur Road, BARODA-390 005.

Telephone 325938 Gram : PONIT



# Thermal Stabilisation of Polyvinyl Chloride: Tin Stabilisers

B. D. GUPTA\* and A. K. MUKHERJEE

Department of Textile Technology, Indian Institute of Technology  
New Delhi - 110 016

## INTRODUCTION

Polyvinyl chloride (PVC) has wide industrial application in both rigid and flexible forms. The major applications of PVC are in the form of films, foams, electrical appliances, wall and floor covering and host of others. However, the basic disadvantage associated with PVC has been its inherent thermal instability which leads to the formation of coloured material on heating, specially in rigid form of PVC. Further in out-door applications, PVC is exposed to heat, light and humidity causing degradation. Some of the degraded products may act as chromophores helping light absorption and subsequent photo-induced chain scission reaction. Although, chain scission and cross linking both take place during thermal exposure of this polymer, the term degradation is usually referred to the dehydrochlorination reaction leading to the conjugated structures.

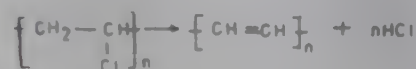
Due to these reasons, it is imperative to use stabilizer as a compounding ingredient for PVC. The nature and type of stabilizer vary according to the requirement. However, incorporation of thermal stabilizer(s) is a must because without it PVC cannot be processed. Lead compounds, combination of calcium and barium compound and tin compounds are very useful and popular. Of all these, tin stabilizers are usually superior (if used judiciously) in stabilizing PVC. The advantages include:

1. Besides being a thermo-stabilizer, they act as anti-oxidant too.
2. They exert curative function by reacting with polyene sequences as in case of tin maleates thereby contributing to shortening of polyene chains responsible for discolouration.
3. They react with already formed onium salt providing another curative function.
4. They provide a compatible system with other components of the mixture.

## Mechanism of Thermal Degradation

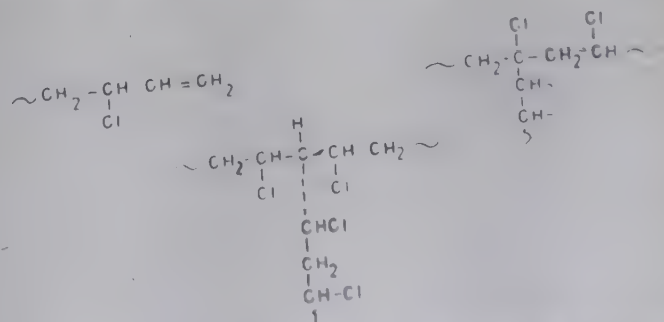
Considerable amount of research has been conducted on the mechanism of PVC. It has been observed that the elimination of hydrogen chloride followed by the

distribution of conjugated polyene sequences along the molecular chain is the first step of degradation.



The thermo oxidative degradation of PVC is thus a complicated chemical process even in the initial stages. Since, the chemical structure of PVC is not expected to be unstable below 200°C as confirmed by the thermal stability of model compounds such as 2, 4-dichloropentane and 2, 4, 6-trichloroheptane etc (1, 2-4), it has been proposed that various structural defects or impurities are responsible for thermal instability in the polymer (5, 6). It has recently been proposed that chloroallyl groups present in PVC have a considerable influence over PVC degradation (7).

However, studies of Calaculacu et al. (8) and Suzuki (9) have shown that branching structures involve only tertiary hydrogen atoms. It therefore, appears that dehydrochlorination may be initiated from such impurities (10) as (a) extraneous impurities, (b) head to head units, (c) oxidation structure, (d) syndiotacticity (e) initiator residue (f) unsaturated chain ends (g) tertiary chlorine atoms and (h) allylic chlorines. However, the relative contribution of these defects to polymer degradation has not been much studied (10). Baum et al. (11) have shown that initiation sites of degradation in PVC are unsaturated chain ends at 150°C and tertiary chlorine at 190°C. It has been proposed that in the presence of tertiary chlorine, the degradation reaction may be initiated at a temperature much lower than that expected (12). Such structures may be represented as:

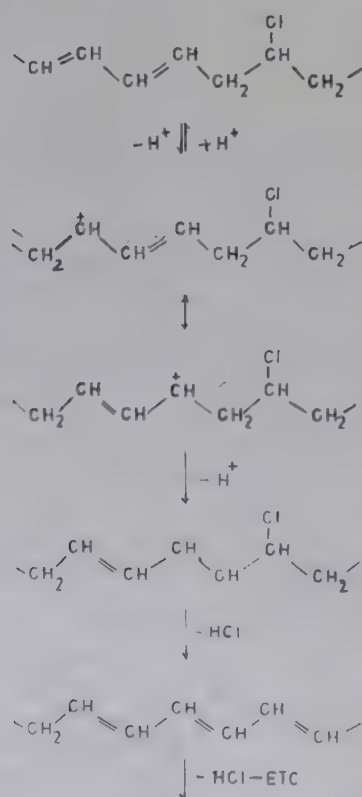


The importance of t-Cl of the branched structures towards thermal dehydrochlorination has been raised by Valko (13). However, it has been accepted that the dehy-

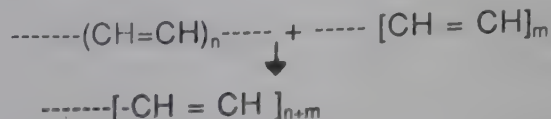
\* Current Address: Laboratoire de Chimie Macromoléculaire SOUS Rayonnement, C.N.R.S., Thiais, France.



dehydrochlorination takes place in the form of zip elimination. The average length of polyene sequences, varies in the range of 4-10 which suggests that dehydrochlorination does not proceed along the entire molecule, instead the chain gets terminated(14). The degradation, therefore, proceeds practically without any molecular chain scission(15). However, the presence of oxygen causes more severe effects on PVC degradation. A correlation between dehydrochlorination and unsaturation has been made by others also (17, 18). Thermal degradation of PVC has been shown to be an autocatalytic process due to the presence of eliminated HCl. The interaction of HCl with polyenes in the molecular chains has been reported by a number of workers (15, 19, 20). The formation of both longer as well as shorter polyene formation has been observed(21). However, the formation of polyene sequence length depends on whether the HCl formed has been removed or allowed to remain in the polymer matrix. Recently Nagy et al.(22) have shown that HCl is able to reinitiate the allyl-activated zip elimination by a mechanism involving proton-exchange with polyenes. In the presence of HCl, proton exchange may lead to the migration of the polyene resulting in the formation of allyl-activated chlorine atom which is then involved in the reinitiation of zip-elimination.



Such a migratory process along the chain facilitates the conversion of short polyene segments into longer one -- thereby linking up the sequences.

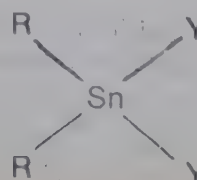


It has been observed that a number of chemical reactions also follow during the course of thermal degradation (23, 24). Studies (25-30) have shown that the rate of degradation and distribution of polyene sequences is highly dependent upon the tacticity of polymer. Since, it is the polymerization conditions (the most prominent being temperature and catalyst) which determine the stereoregularity of PVC(31, 32), the careful selection of these parameters may be useful in reducing the degradative nature of the polymer. It has been found that degradation is much higher with the increase in syndiotacticity in the polymer and results in the formation of long polyene sequences(31). These observations suggest that the propagation of conjugated structure is facilitated along the syndiotactic sequences. Park and Skeno(32) presented a relation between the dehydrochlorination rate of PVC obtained by solution polymerization using four initiators. They reported that the dehydrochlorination rate decreased in the following order:

Lauryl peroxide > diisopropyl peroxydicarbonate >

benzoyl peroxide > azobis isobutyronitrile

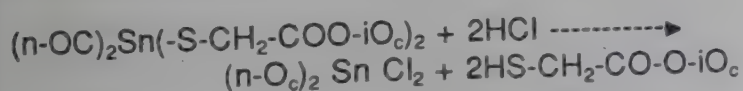
They found that the degradation rate of PVC increased with the increasing initiator content. An interesting study on the X-ray-induced polymerization of PVC has been reported by Henderson et al. 33. It was found that the polymer prepared at less than 0.45 Mrad exposure had thermal stability comparable to that of commercial suspension grade PVC. It has been proposed that allylic chlorines produced during radiolysis could be responsible for the decrease in stability. A wide variety of stabilizers is available which may provide a material with acceptable thermal stability, the most common ones being organometallic compounds such as organotin mercaptide, maleates, barium/cadmium carboxylates, organic phosphite and epoxy compounds. However, the organotin mercaptide, of the general formula





where R is CH<sub>3</sub>, C<sub>4</sub>H<sub>9</sub>, etc. and Y is OOCR', OOCCH=CH COOR' or SCH<sub>2</sub>COOR', have proved to be very effective class of stabilizers for PVC because of their excellent performance for all the methods of processing and hence, constitute a large fraction of the current research on thermal stabilization of PVC with special attention to their mode of action(34-36). Of the several organotin compounds currently in use for PVC thermal stabilization, dialkyltin bis (iso-octyl thioglycolate) has shown better results.

As discussed earlier, hydrogen chloride exerts a catalytic action to the thermal degradation of PVC and proceeds by an ionic or molecular-ionic mechanism. Therefore, using effective acceptors of HCl, it may become possible to reduce the auto-catalytic dehydrochlorination of PVC. Consequently, deactivation of ionic pairs and ions involved in chain-ionic mechanism or else the interaction of a compound with conjugated double bonds should also be effective in reducing degradation of PVC. A number of studies(37-39) have shown that the stabilisers provide maximum thermal stabilisation for PVC by (a) eliminating labile sites responsible for dehydrochlorination, (b) acting as HCl scavenger, (c) reacting with free radicals as they are formed and (d) acting as antioxidants. The efficiency of organotin mercaptides lies in the fact that they are capable of binding the hydrogen chloride and hence neutralise its accelerating effect on the dehydrochlorination. Rockett et al.(40) have shown that such a behaviour provides a preventive function to the degradation. This observation was based on his earlier studies(41) involving the cleavage of organotin compounds by aqueous hydrochloric acid.



The tin chlorides thus formed are still able to retard the thermal dehydrochlorination of PVC. This may be because of the complex formation between tin chlorides and allyl structures along the molecular chain. It does not mean that such chlorides could provide a thermal stabilizing system to the polymer, where like conventional stabilisers, an induction period is of utmost importance and hence, such chlorides may be expected to enhance the overall efficiency of the stabiliser. Hoang et al.(42) have determined the retardation effect of various alkyl-tin chlorides on the dehydrochlorination in PVC, which depends upon the Lewis acidity of the compound. They found that butyltin mono and dichlorides exert good retardation effect in the system. However, trichloride act as efficient pro-degradant catalyst but the effect being much lower than that of ZnCl<sub>2</sub>. A study(43) has shown that certain structural features in tin stabi-

lizer are desirable for good stabilisation but, in general, there does not exist any exact correlation between the structure and stabilising efficiency. Ayrey et al.(44) tried to correlate the effect of alkyl group of organotin bis (iso-octyl thioglycolate) with their stabilising efficiency in PVC. As such no single conclusion could be drawn from his results. However, n-alkyl group was found to provide better stabilisation than branched ones (Table I). Further, alkyl derivatives were found to be superior to the aryl derivatives probably because of their higher susceptibility towards carbon-tin bond cleavage by HCl, a reaction which reduces pro-degradant tin IV chloride(45).

TABLE-I  
Efficiency of Organotin bis(isooctyl thioglycollate) R<sub>2</sub>Sn(SCH<sub>2</sub>COO(C<sub>8</sub>H<sub>17</sub>-I) for PVC@

R	Time for first perceptible colour (min)	Time for sample to become black or dark brown (min)
Me	50	80
Et	60	80
Pr	40	90
Bu	40	70
t-Bu	20	30
C <sub>8</sub> H <sub>17</sub>	40	70
Me <sub>3</sub> SiCH <sub>2</sub>	20	50
PhCH <sub>2</sub>	20	30
BrCH <sub>2</sub>	0	0
PhCH <sub>2</sub> CH <sub>2</sub>	20	50
EtOCOCH <sub>2</sub> CH <sub>2</sub>	20	40
Ph	20	50
P-MeOC <sub>6</sub> H <sub>4</sub>	10	10
P-PhOC <sub>6</sub> H <sub>4</sub>	10	10
P-ClC <sub>6</sub> H <sub>4</sub>	10	30
P-CF <sub>3</sub> C <sub>6</sub> H <sub>4</sub>	10	40
O-MeO C <sub>6</sub> H <sub>4</sub> +	20	20
O-PhOC <sub>6</sub> H <sub>4</sub>	20	40
O-F C <sub>6</sub> H <sub>4</sub>	20	30
No stabiliser	0*	0*

@ = 2% stabiliser introduced using hot mill. Samples then aged at 195°.

+ = Corresponding time for bis co-methoxyphenyl tin bis (methyl thioglycollate) is 10,20

\* = Discolouration occurred during milling.

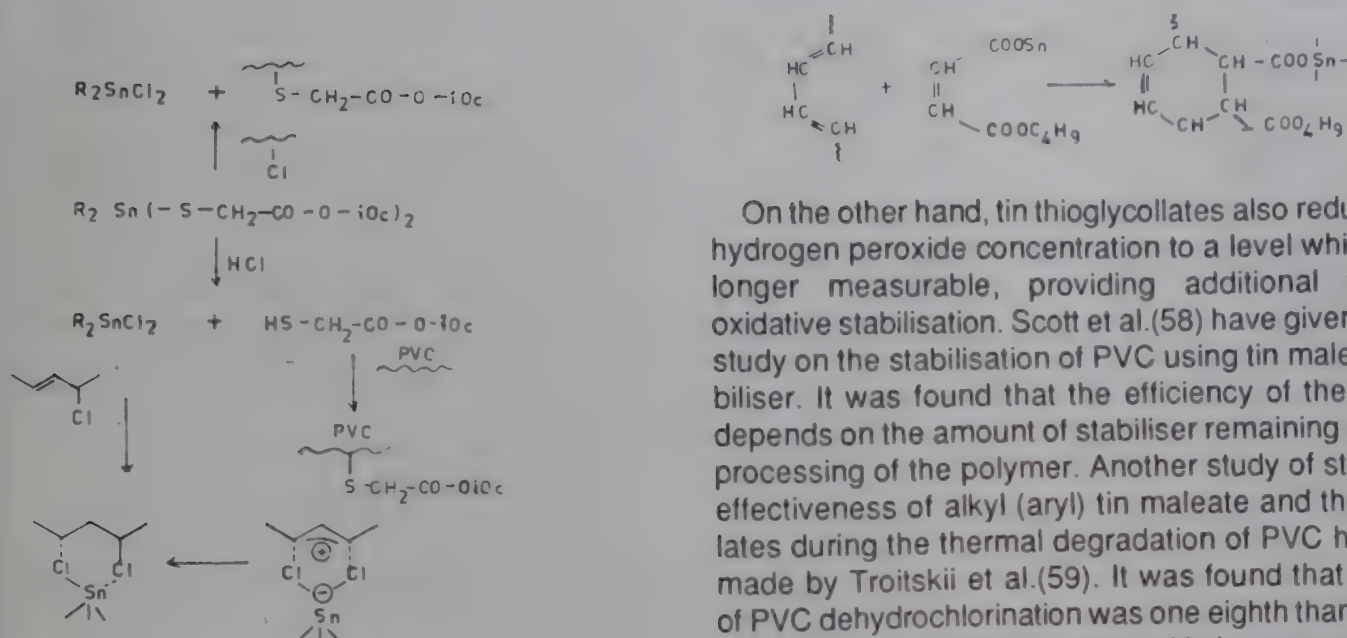
In another study, it has been found by Pollar(34) that the effectiveness of stabiliser is decreased with the increase in alkyl chain length 'R'. The substitution of a H-atom in the α-position of the alkyl group by electron withdrawing group reduces the stabilising action as







subsequently by a Diels-Alden reaction and hence in such cases, the unsaturation remains constant(57).



Scheme 1. Stabilising mechanism of Tin mercaptides

boride and were less effective. The organotin carbox-  
es were very poor stabilisers and did not produce  
e thiols and aqueous hydrochloric acid. These results  
ggest that the reaction of  $HCl$ , i.e., trapping of  $HCl$   
the stabiliser is a prominent factor and a measure  
stabilising efficiency.

Among the other tin compounds, maleates have been  
ed for the thermal stabilisation of PVC. But, their effi-  
ncy to the system is poor in comparison to thiogly-  
lates. It may be because of the dienophilic nature of  
aleic acid. However, such stabilisers are very good for  
eir photo-stabilising action even better than thiogly-  
ates where the sensitising nature of mercapto group  
erates in the system. Coorey and Scott(56) have  
ven a comparative study of stabilisation mechanism  
dibutyltin maleate (DBTM) and dioctyltin bis(isooctyl  
o glycollate) (DOTG) during thermal processing. Thi-  
glycollate is relatively more effective than DBTM as  
ermal stabiliser during processing. Both these stabi-  
ers have ability to introduce induction period by react-  
g with the allylic chlorine and hydrogen chloride formed  
ring degradation. However, in contrast to maleate sta-  
isers, DBTG, has additional capability of reacting with  
e unsaturated structures formed as a consequence of  
echano-chemically induced dehydrochlorination,  
ereby resulting in a decrease in the initial unsatura-  
n in PVC(56). Tin maleates do not have such ability,  
stead they react with conjugated double bonds formed

On the other hand, tin thioglycollates also reduces the  
hydrogen peroxide concentration to a level which is no  
longer measurable, providing additional thermo-  
oxidative stabilisation. Scott et al.(58) have given a good  
study on the stabilisation of PVC using tin maleate sta-  
biliser. It was found that the efficiency of the system  
depends on the amount of stabiliser remaining after the  
processing of the polymer. Another study of stabilising  
effectiveness of alkyl (aryl) tin maleate and thioglycol-  
lates during the thermal degradation of PVC has been  
made by Troitskii et al.(59). It was found that the rate  
of PVC dehydrochlorination was one eighth than the rate  
of polymer degradation in vacuo with the removal of  $HCl$ .  
The stabilising efficiency of the maleate and thioglycol-  
late has been ascribed to the trapping of  $HCl$ , interac-  
tion with conjugated double bonds of degraded PVC and  
reaction with the labile chlorine atoms at  $\beta$ -position to  
the double bonds (chloroallylic groups). Interestingly,  
Lagner et al.(60) found that the radiation grafting of sty-  
rene or acrylonitrile to PVC is sharply reduced by the  
addition of such tin stabilisers as dibutyl tin laurate, dib-  
utyltin methylene bis (thioglycollate), and dibutyltin  
octamethylene bis (thioglycollate). This could be  
because of the retardation in the decay of free radicals  
in PVC by these compounds which are presumed to  
inhibit free radical reaction.

## CONCLUSION

Polyvinyl chloride has become a material of wide  
industrial importance, in particular for construction appli-  
cation, flooring and wall covering. One of the drawbacks  
associated with the polymer has been its degradation  
leading to discolouration during processing at elevated  
temperature. This is because of certain inherent impur-  
ities in the polymer which may arise during the poly-  
merization itself(61). Several additives have been used  
to impart thermal stability in the polymer but, no satis-  
factory combination could be established. However, cur-  
rent research indicates that tin stabilisers show much  
better results when milling is carried out with PVC. The  
stabilisers, such as, isooctyltin bis (thioglycollate), impart  
resistance to initial discolouration which is the first req-  
uisite for PVC stabilisation.

The efficiency of tin stabilisers lies in the fact that they



not only act as binders of hydrochloric acid which acts as an accelerator for PVC degradation but also eliminates labile sites responsible for dehydrochlorination. Thus it is now possible to stabilize PVC more effectively against thermal degradation by the use of tin stabilisers.

## REFERENCES

1. J.A. Rhys., *Appl. Plast.*, **4**, 47 (1961).
2. M. Asahina and M. Ozonuka, *J. Polym. Sci.*, A-2, 3505, 3515 (1964).
3. L. Valko and I. Tvaroska, *Europ. Polym. J.*, **7**, 41 (1971).
4. H.V. Smith, *Rubber Plast.*, **4**, 47 (1961).
5. J.J.P. Staudinger, *Plast. Progr.* (London), **9** (1953).
6. W.H. Star'nes Jr., *Dev. Polym. Degrad.*, **3**, 135 (1981).
7. Z. Vymazal, L. Mastuy and L. Vymazalova, *Europ. Polym. J.*, **21**, 747 (1985).
8. A.A. Caraculacu, *J. Polym. Sci.*, A-1, **8**, 1239 (1970).
9. T. Suzuki, M. Nakamura, M. Yasuda and T. Tatsumi, *J. Polym. Sci.*, C(33), 281 (1971).
10. K.B. Abbas and E.M. Sorvik, *J. Appl. Polym. Sci.*, **20**, 2395 (1976).
11. B. Baum and L.H. Wartman, *J. Polym. Sci.*, **28**, 537 (1958).
12. A.A. Caraculacu, *J. Polym. Sci.*, A-1, **4**, 1839 (1966).
13. L. Valko, I. Tvaroska and V. Kello, *Chem. Zvesti*, **26**, 3 (1972).
14. G. Palma and M. Grenza, *J. Appl. Polym. Sci.*, **16**, 2485 (1972).
15. S.N. Gupta, J.P. Kennedy, T.T. Nagy, F. Tudos and T. Kelen, *J. Macromol. Sci., Chem.*, A-12, 1407 (1978).
16. W.O. Geddes, *Europ. Polym. J.*, **3**, 267 (1967).
17. D. Braun, *Pure Appl. Chem.*, **26**(2), 173 (1971).
18. T. Suzuki and M. Nakamura, *Jap. Plast.*, **4**, 16 (1970).
19. E.D. Owen and I. Pasha, *J. Polym. Sci., Polym. Lett.*, **16**, 429 (1978).
20. F. Tudos and T. Kelen, *Macromol. Chem.*, **8**, Ed. K. Saarela, Butterworths, London (1973) p. 393.
21. T. Kelen, G. Balint, G. Galambos and F. Tudos, *J. Polym. Sci.*, C-33, 211 (1971).
22. T.T. Nagy, T. Kelen, B. Turcsanyi and F. Tudos, *Polym. Bull.*, **2**, 77 (1980).
23. T. Kelen, *J. Macromol. Sci., Chem.*, A-12, 349 (1978).
24. F. Tudos, T. Kelen, T.T. Nagy and B. Turcsanyi, *Pure & Appl. Chem.* **38**, 201 (1974).
25. G. Martinez, C. Mijangos and J. Millan, *J. Appl. Polym. Sci.*, **29**, 1735 (1984).
26. J. Millan, G. Martinez and C. Mijangos, *Polym. Bull.*, **5**, 407 (1981).
27. J. Millan, E.L. Madniga and G. Martinez, *Die. Angew. Makromol. Chemie.*, **45**, 177 (1975).
28. J. Millan, M. Carranza and J. Guzman, *J. Polym. Sci., Symp.*, **42**, 1411 (1973).
29. G. Martinez, C. Mijangos and J. Millan, *Europ. Polym. J.*, **21**, 387 (1985).
30. G. Martinez, C. Mijangos and J. Millan, *J. Appl. Polym. Sci.*, **28**, 33 (1983).
31. J. Millan, E.L. Madniga, M. But and A. Guyot, *J. Polym. Sci. Polym. Lett. Ed.*, **11**, 3299 (1973).
32. J. Park, *J. Appl. Polym. Sci.*, **27**, 4879 (1982).
33. N.K. Henderson, S. Yamakawa, V.T. Stannett and W.I. Brough, *J. Macromol. Sci.-Chem.*, A9, 415 (1975).
34. P.C. Pollar, *J. Macromol. Sci.-Chem.*, A-12, 373 (1978).
35. T.B. Zararova, N.A. Okladnov, G.T. Fedoseyeva and K.S. Mirker, *Vysokomol. Soyed.*, A-13, 1003 (1971).
36. P.P. Klemchuk, *Adv. Chem. Ser.*, **85**, 1 (1968).
37. T. Suzuki, I. Takakura and M. Yoda, *Europ. Polym. J.*, **7**, 11 (1971).
38. R.C. Poller, *The Chemistry of Organotin Compounds*, Logos Press, London, Academic Press, New York (1970).
39. G. Ayrey, P.C. Poller and I.H. Siddiqui, *J. Polym. Sci.*, A-1, 725 (1972).
40. B.W. Rockett, M. Hadlington and W.R. Poyner, *J. Appl. Polym. Sci.*, **18**, 745 (1974).
41. B.W. Rockett, M. Hadlington and W.R. Poyner, *J. Appl. Polym. Sci.*, **17**, 3457 (1973).
42. T.V. Hoang, A. Michel and A. Guyot, *Polym. Degradn., Stab.*, **137** (1981).
43. H.V. Smith, *Organotin Stabilizers*, The Tin Research Institute, Greenford (1959).
44. G. Ayrey, F.P. Man and R.C. Poller, *Europ. Polym. J.*, **17**, (1981).
45. *Manual of PVC Additives*, Ed., CIBA-GEIGY, Marienberg GmbH (1971), p.33.
46. F. Alavi-Moghadom, G. Ayrey and R.C. Poller, *Europ. Polym. J.*, **11**, 649 (1975).
47. B.W. Rockett, M. Hadlington and W.R. Poyner, *Polym. Lett.*, **371** (1971).
48. A.H. Fyre and R.W. Horst, *J. Polym. Sci.*, **40**, 419 (1959).
49. A.H. Fyre and R.W. Horst, *J. Polym. Sci.*, **45**, 1 (1960).
50. A.H. Fyre, R.W. Horst and M.A. Paliobagis, *J. Polym. Sci.*, A **1785**, 1801 (1964).
51. A.H. Fyre, R.W. Horst and M.A. Paliobagis, *J. Polym. Sci.*, A **1765** (1964).
52. T.V. Hoang, A. Michel and A. Guyot, *Polym. Degradn. Stab.*, **277** (1980).
53. G. Ayrey, R.C. Poller and I.H. Siddiqui, *J. Polym. Sci., Polym. Lett.*, **8**, 1 (1970).
54. T. Suzuki, I. Takakura and M. Yoda, *Europ. Polym. J.*, **7**, 11 (1971).
55. M.W. Pollock, U.S. Patent, 3, 507, 827 (1970); *Chem. Abstr.*, **26264** (1970).
56. B.B. Cooray and G. Scott, *Polym. Degradn. Stab.*, **2**, 35 (1980).
57. G. Scott, M. Tahan and J. Vyvoda, *Europ. Polym. J.*, **14**, 4 (1978).
58. G. Scott, M. Tahan and J. Vyvoda, *Europ. Polym. J.*, **15**, (1979).
59. B.B. Troitskii, L.S. Troitskaya, V.N. Denisova, M.A. Novikova, and Z.B. Luzinova, *Europ. Polym. J.*, **13**, 1033 (1977).
60. H. Laugner, G. Zeppenfeld and A. Bartl, *Plast. Kautschuk*, **76** (1966).
61. B.D. Gupta and J. Verdu, *Polym. Engg. Sci.*, In Press.



**ALCOA****CALCINED ALUMINAS FOR -**

POLISHING COMPOUNDS  
HIGH TENSION INSULATORS  
CERAMIC SPARK PLUGS  
HIGH ALUMINA REFRACTORIES

**REACTIVE ALUMINAS FOR -**

INDUSTRIAL CERAMICS

**ACTIVATED ALUMINA AS -**

ABSORBENT AND CATALYST

**HYDRATED ALUMINA AS -**

FIRE RETARDENT

**TABULAR ALUMINA FOR -**

SPECIAL REFRACTORIES

**CALCIUM ALUMINATE CEMENT FOR -**

CASTABLE REFRACTORIES

**CHIKA LIMITED**

Mehta Chambers, 13, Mathew Road, Bombay-400 004.

Phone : 8113456/1457 Cable: "DYECOLD" Telex: 11 75562 and 11 75534

Branches :

AHMEDABAD : Ashram Road, CALCUTTA : 36 Ganesh Chandra Avenue

MADRAS : 122 Mount Road, NEW DELHI : 25/1 Asaf Ali Road



*Acclaimed as Indispensable reference books for all those involved  
in the wet processing industry*

# **TECHNOLOGY OF TEXTILE PROCESSING**

**(TEN VOLUMES)**

by

PROF. V.A. SHENAI

University Department of Chemical Technology, Bombay

Vol. I	-- TEXTILE FIBRES	Rs. 100.00
Vol. II	-- CHEMISTRY OF DYES & PRINCIPLES OF DYEING	Rs. 125.00
Vol. III	-- TECHNOLOGY OF BLEACHING	Rs. 090.00
Vol. IV	-- TECHNOLOGY OF PRINTING	Rs. 100.00
Vol. V	-- CHEMISTRY OF TEXTILE AUXILIARIES	Rs. 075.00
Vol. VI	-- TECHNOLOGY OF DYEING	Rs. 100.00
Vol. VII	-- SYNTHETIC ORGANIC TEXTILE CHEMICALS (With Naresh M. Saraf)	Rs. 060.00
Vol. VIII	-- EVALUATION OF TEXTILE CHEMICALS (With R.H. Mehra)	Rs. 060.00
Vol. IX	-- FUNDAMENTAL PRINCIPLES OF TEXTILE PROCESSING	Rs. 075.00
Vol. x	-- TECHNOLOGY OF FINISHING (With Dr. Naresh M. Saraf)	Rs. 100.00

Add Rs. 15.00 per book for postage.

Payments in Advance. No V.P.P.

Please Contact:

## **SEVAK PUBLICATIONS**

306, Shri Hanuman Industrial Estate, G.D. Ambekar Road, Wadala, P.B. No. 7110, Bombay 400 031.  
Phones: 4131198/4120743 \* Telex: 011-76053 CWLY IN

Madras Office: 27, Begum Sahib Third Street, 1st Floor, Mount Road, Madras 600 002.  
Phones: 831808 \* Telex: 041-6290 CWLY IN



## Chemical News From Abroad

### EXXON STUDIES LLDPE UNIT, KEMYS CRACKER PLANS

Exxon Chemical is studying the possibility of building a low density/high density polyethylene plant in Europe. The facility would be the first of its kind for the company in the region. It is a major world supplier of lldPE from its plants in the U.S. and its Kemya joint venture with Sabic in Saudi Arabia.

Now, however, a belief that the linear polyethylene market will require new capacity in the 1990s may lead to a decision to invest in Western Europe, probably at Notre Dame de Gravenchon in France.

Exxon has been one of the main voices in recent years against the need for new ethylene and polyethylene capacity on the grounds that "capacity creep" at existing plants would see the industry through until the late 1990s.

But Robert Wilson, Exxon Chemical International vice president, says linear polyethylene consumption will grow faster than the rest of the polyethylene market and might require a new plant. This is among other possibilities being studied for Exxon's polymers business. A 50,000 ton/year Unipol process plant is being looked at.

Wilson denied reports that Exxon Chemical wanted a plant in Western Europe in case its Saudi Arabian partners decided to nationalize the Kemya joint venture at Al Jubail. "Output from Kemya is in our strategic planning for the future" Wilson said, adding that studies were underway concerning a capacity hike at the plant.

Other Saudi joint venture partners report no knowledge of clauses allowing the Arab partners to buy out their foreign partners, observing that this would provide very poor publicity for future investors.

Wilson also denied rumours that Exxon Chemical is planning a new cracker at Antwerp to feed a polyethylene expansion in Europe. "We think we can get our ethylene from existing facilities", he said, noting that the company was adding new furnaces at the Fife ethylene cracker in Scotland and at Notre Dame de Gravenchon and is still examining other such possibilities. It is, however, planning to start shipping ethylene to the US, which will take ethylene out of its European system.

It may be noted that a new cracker for the late 1990s would not be inconsistent with Exxon Chemical's capacity creep theory as outlined earlier this year. Then it was forecast that ethylene operating rates would drop to 86-87 per cent in the early 1990s and would not recover to above 90 per cent until late in the century.

Many companies are already believed to be planning forward for this period. In addition to supply and demand reasons, one of the driving factors behind decisions on the next major ethylene investment in Western Europe could be feedstock availability. For this reason it has been believed that it would be the major oil companies that would be the main players in the petrochemical sector at the turn of the century.

"All product areas are coming up short. I would be surprised if a lot of people are not re-evaluating where they are going," Clive

Thompson, a chief executive of BP Chemicals said.

Among long term factors to be considered is availability of types of feedstock other than naphtha.

According to Thompson: LPGs will be ripe for feedstock use in the 1990s. Whereas four or five years ago you could expect the LPG window in summer to last two to four months. In 1988 the LPG window could be ten months — the surplus is with us already."

Another factor which he believes will drive investment decisions is technology. There may be no revolution in ethylene technology but older crackers are less and less efficient: "By 1996 we will have a 30 year old petrochemical industry," Thompson observes. His company is itself close to a decision with its partner Bayer on reactivating the 360,000 ton/year number 4 cracker at Erdolchemie in West Germany but information is thin on the company's longer term plans.

Statoil's proposals for a cracker at Zeebrugge, Belgium, revealed last year, were based on availability of North Sea gas and have only been hampered by internal financial problems at the Norwegian company.

Meanwhile Petrofina and Neste's plans are well established for Europe's only current grassroots cracker, the new Finaneste unit at Antwerp. Some people still believe the next unit after that will be an "industry cracker" shared between the main players, although reports are firming up on a new unit in southern Europe.

In general European players appear relatively cautious on new building plans for the longer term at this moment in time.

In North America, on the other hand, five new crackers are re-



ported, one in Canada and four in the US by Quantum, Phillips, Dow and Formosa Plastics — although not all plans are firm. Here, though, the view has been expressed by at least one Wall Street observer that cutbacks implemented by the contractors in the recent lean years have left them short of engineering capability to build all planned units. There may be delays in getting equipment such as compressors, for example.

### ICI PAINTS MOVES INTO SPAIN

ICI has finally secured a slice of the Spanish paints market with the acquisition of Du Pont's powder coatings business. This is a core business for ICI's paints operations and the deal will give the world's biggest coatings maker a 20 per cent share — worth around \$6.9m — of the Spanish powder coatings market. Terms of the deal are not disclosed.

Du Pont manufactures powder coatings at its Benicarlo site south of Barcelona and will continue to supply ICI for a transitional period.

ICI became the world's top paint producer when it acquired US-based Glidden from Hanson Trust in 1986. The group has operations worldwide but has targeted both the Spanish and Italian markets in order to strengthen its European portfolio. ICI is also thought to be interested in acquiring Spanish automotive coatings producer, Barnices Valiente.

Currently the world powder coating market is worth \$850m. In Europe the leading players include DSM, International Paint, Ferro, Becker and ICI.

### COOKSON BID REBUFF

Cookson group has made a £27.3m (\$44m) bid for Wolstenholme Rink, a Lancashire-based lithographic printing products and metal powders concern. The move comes just a week after Cookson acquired a 6.3 per cent stake in Johnson Matthey for £32.2m.

Although Cookson is not known for making hostile bids, Wolstenholme Rink is reported as describing the offer as most unwelcome. Cookson decided to proceed with the offer after management discussions between the two companies failed to produce recommendations to sell from Wolstenholme.

The two companies have several common businesses and from a strategic point of view Wolstenholme's operations would provide a good fit with Cookson. Cookson is thought to be particularly attracted to Wolstenholme's offset lithographic printing products.

### EVC BUYS TPV

European Vinyls Corp (EVC), the PVC joint venture equally owned by Enichem and ICI, has made its first acquisition. It has acquired a minority shareholding in TPV, an Italian PVC compound manufacturer with a 10 per cent share of the market.

Eni's executive council has approved the deal which is thought to signal its go ahead for Enichem, through EVC, to move further into downstream PVC perhaps involving further acquisitions.

ICI is due to turn over to EVC its existing downstream PVC operation next year.

### CdF CHIMIE FERTILIZERS POISED FOR PROFITS

After years of losses, CdF Chimie's fertilizers business could be set to haul itself out of the red providing the trends seen in the first half of 1988 continue for the next six months. Next year, the division should turn in a profit.

According to CdF Chimie's general manager Jean-Pierre Halbron, the company has been "pursuing a strategy over the last two years that should start bringing in money."

In a recent interview, Halbron said that the initial restructuring moves implemented before the merger of Societe Chimique de la Grande Paroisse and CdF Chimie AZF (of which he is president) some eight months ago will be complete by the year end. The modernization programme designed to improve productivity and cut costs will continue.

The French firm has concentrated production at fewer sites while closing down smaller units and plants not close enough to centres of consumption, Halbron explains.

When all the closures are complete, the workforce will stand at around 3,500.

Grande Paroisse and AZF share production sites at Grand Quevilly near Rouen and Nangis, east of Paris. Production is concentrated at these larger sites. So, at Grand Quevilly, some FF300m (\$49m) has been spent to increase nitric acid and nitrates capacity by 1,500 ton/day, due on stream next January. Various investments totalling FF100m have been made at both this site and at Toulouse, Mazingarbe, Wazier and Montoir.



Despite their links, Grande Paroisse and AZF are managed as two separate entities with their own production and marketing works. This, explained their president, is in order to maintain their competitiveness.

Grande Paroisse's main rivals in nitrate fertilizers are majors such as Norsk Hydro and BASF, while AZF operates in competition with small local producers making complex fertilizers. This is why AZF's 800,000 ton/year capacity for complex fertilizers is kept out of the merger.

The GP-AZF venture focuses mainly on nitrate fertilizers. Capacity for phosphate fertilizers has been cut from 2.5m ton to 1.3m ton. Halbron claims that AZF ranks second in Europe after Norsk Hydro for production of nitrate fertilizers and fourth in complex fertilizers. France is Europe's second largest consumer of liquid nitrate solutions but AZF has virtually ceased production because of intense US competition where producers have been helped by the weak dollar, low gas prices and low freight rates.

Although Halbron concedes that the fertilizer business combines the problems of a cyclical commodity business with the uncertainties of the agriculture sector, he believes CdF has successfully positioned itself as one of the few European companies that will stay in the fertilizer sector. "We are ahead of our competitors in our restructuring process," he claims.

Together, AZF and GP produce 2.7m ton/year of simple nitrate fertilizers and 2m ton/year

complex fertilizers. "We are operating in Europe's largest market for fertilizers. In this business, it is important to be near the consumer. Since the AZF-GP merger we have saved FF50m this year in transport costs."

Halbron maintains that despite the EEC freeze on the development of more arable land, fertilizer consumption will grow by around 2 per cent/year. But he warns of the threat of cheap imports from the US.

To survive in the fertilizer business, a company must be flexible, avoid stock building and focus on productivity, Halbron concluded.

Turning to Norsolor, the division which now encompasses all CdF's Chemical's operations, the

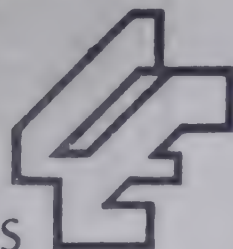
executive said the aim was to increase productivity. While 500 jobs are to go from the French state-owned firm, the general manager stressed no sites will be shut down.

At Dunkirk, debottlenecking work will increase polyethylene capacity by "a few tens of thousands of tons". A decision still has to be made on whether to debottleneck the ethylene cracker or double capacity, but a partner will be needed if the latter option is selected. And although the petrochemicals market is strong, Halbron said that Norsolor's strategy is to develop downstream rather than upstream.

On the acquisitions front Halbron said the firm is on the lookout for an opportunity to bolster its international base.

#### REGULARLY AVAILABLE :

Sulphamethoxazole IP  
Trimethoprim IP ★ Ibuprofen IP  
Ethambutol HCl, IP  
Mebendazole USP  
Piperazine Citrate IP  
p-Chloro Benzoic Acid  
o-Chloro Benzoic Acid  
P.T.S. Amide ★ P.T.S. Chloride  
Calcium Oxide (Pharma Grade)  
Aluminium Chloride Crystal  
Acetyl Chloride  
Benzoyl Chloride  
Saccharine (Insoluble)



CHEMAROMA ENTERPRISES

4th Floor, Readymoney Terrace, 187, Dr. Annie Besant Road,  
Worli, Bombay-400 018. Phones: 4938477/4934459



It had secured government agreement on the purchase of the Borg-Warner ABS business and had prepared financing for the deal, but plans were thwarted by GEP of the US, which purchased the firm last month. Had it been successful in the bid for Borg-Warner, the French firm would have had to sell off parts of the business to meet its loan repayments.

Now Norsolor is once again seeking the right opportunity but, Halbron pointed out, these are few and far between.

It is hampered by a relatively thin international production base and "our intention is to make acquisitions in Europe and the US," he says. The FF-500m capital increase recently announced by Norsolor was to help fund such a purchase.

### EXXON CLEARED IN PE CARTEL CASE

Proceedings have been dropped against Exxon Chemical in the current polyethylene cartel investigations in Europe. The company, along with a number of others, was the subject of proceedings by the EEC commission concerning possible antitrust violations.

It vigorously denied the allegations that it had been involved in any way with an LDPE cartel which the commission alleges operated in Europe during the early eighties.

Exxon Chemical says that after examining documentary evidence filed in response to the commission's statement of objections,

the director general of competition has accepted the company's position and has advised that: "There is no reason for continuing the procedure as far as Exxon Chemical is concerned."

The US firm says it regards the commission's conclusions as an important endorsement of Exxon's policy of strict compliance with applicable laws, wherever it does business.

Robert Wilson, vice president of Exxon Chemical International said: "We try to uphold the highest standards of ethical behaviour in our business and I'm pleased that the commission's findings confirm that."

Wilson was due to appear in person before the commission last week but the company was given the all clear without that being necessary.

It is speculated that in exculpating itself, Exxon Chemical may have "dropped the other firms further in the fertilizer."

### URALITA ACQUIRES ARAGONESAS STAKE

A 33 per cent stake in Spain's Energia e Industrias Aragonesas has been acquired by the Spanish construction materials group, Uralita.

The investment is reputed to have cost Uralita's owner, the banking and property group March, around Pta10bn (\$73m).

According to both companies the acquisition is "friendly" and has led to March taking a seat on the board of the chemicals and electricity concern.

*For Quality & Quantity*

**MONO CHLORO BENZENE  
PARA DICHLORO BENZENE  
ORTHO DICHLORO BENZENE**

*please contact*

**nascent chemical industries  
private limited**

24, INDUSTRIAL ESTATE, VAPI.



Admn. Office : 909 Raheja Centre, Nariman Point,  
Bombay-400 021. Phones : 244626/243939



Aragonesas has been the subject of heavy stock market activity in recent weeks and state-owned oil and petrochemicals group Repsol disclosed it has acquired a 5 per cent stake at an estimated cost of Pta 1.8bn.

It is believed by local sources that one of the shareholders may make a public bid for Aragonesas before the end of the year.

A booming caustic soda market is currently giving Aragonesas record sales. For the 12 months to May, turnover was up 20 per cent on the previous year at Pta 8.9bn.

#### SCHERING PLANS U.S. FATTY ALCOHOLS HIKE

West Berlin-based Schering has announced plans to invest \$50m in a major expansion of its fatty alcohols business in the U.S. Schering's industrial chemicals arm, Sherex, located in Dublin, Ohio, will expand capacity from a current 7,000 ton/year to as much as 67,000 ton/year.

The project will involve the construction of a new 40,000-60,000 ton/year plant and is expected to come on stream during the first quarter of 1991. Feedstocks for the facility will include renewable natural oils and fats, such as beef suet, coconut oil and palm oil.

The Schering group's fat chemicals operations are currently based at Mapelton, Illinois where the production slate includes fatty acids, fatty amines and derivatives, along with glycerines. Basic engineering studies for the project are being carried out by

West German engineering contractor, Lurgi.

In addition to Mapelton the group is also considering two other possible sites where Sherex already has production units. These are at Janesville, Wisconsin and at Lakeland, Florida.

Schering indicates that it will use a new technology in the plant which will be able to exploit natural oils and fats better than petrochemical technologies currently in use. No details about this subject were released, however, "for reasons of competition."

Schering is the second German oleochemicals producer to announce a major capacity expansion for fatty alcohols in the U.S.

where the market is led by consumer giants, Procter & Gamble and Colgate-Palmolive, both of which use petrochemical feedstocks.

Henkel recently said that it plans to build a 30,000 ton/year fatty alcohols plant in either Texas or the Midwest, using a new process involving one-step hydrogenation of triglycerides. The Dusseldorf group has licensed the technology to West German engineering contractor, Uhde.

Henkel has said that it is aiming to corner 10 per cent of the U.S. fatty alcohols market but Schering declined to be specific on its market share intentions. However, it is understood that it will be hoping for a somewhat larger slice of the cake than Henkel.

**GUM**



**GUM**



**GUM**

FOR YOUR REQUIREMENTS OF :

**GUM ARABIC**

**GUM ACCACIA**

**GUM KORDOFAN**

**I.P. Grade, Crystal & Powder Form**

**GUAR GUM**

**Printing, Sizing, & Pharma Grade**

Please Contact :

**M/s. Pannalal Lilachand  
& Company**

89, Kazi Syed Street, Mandvi,  
BOMBAY-400 003.

Telephones : 32 70 60/344075/347510

Telex : 11-71001 Mecoln. Grams : GUMSTARCH.



## SOLVAY QUILTS BRAZIL PLASTICS SCENE

Belgium's Solvay has completed its withdrawal from the Brazilian plastics business with the sale of its two subsidiaries to local producers. PVC producer Plavigor has been sold to Companhia Prada for an undisclosed sum, following the sale of Electroflex Industrias Plasticas to Tupy Tecnoplastica in April.

Negotiations were undertaken by Plasticos Plavinil, which already has a major stake in Plavigor. A spokesman at Solvay said this represented the last move in quitting its Brazilian plastics operations to concentrate on chemicals. Solvay's largest Brazilian interest is in Industrias Quimicas Electro Cloro, a chloralkali producer.

## DSM PART-FLOTATION DELAYED

The September date mooted for DSM's partial privatization is unlikely to be met as the Dutch parliament failed to debate a bill on the flotation before adjourning for the summer recess. Parliament does not reconvene until late August.

The share issue, which involves 30 per cent of the Dutch chemicals group, will go ahead after the bill has been approved by both houses of parliament. It is not known how long this will take. The government has received advice on the proposed flotation from a council of state advisory board.

Meanwhile, DSM is continuing its preparations for entry onto the stock exchange. Based on its profits ratio and taking into ac-

count the value of comparable companies, the whole of DSM is estimated to be worth between Df1.2-3bn (\$1-1.5bn). In 1987, DSM had profits of Df1.442m and sales of Df1.9.22bn.

## JOBS CUT AT PHOSPHATE UNIT

Benckiser-Knapsack, a 50:50 joint venture of West German firms Benckiser and Hoechst, has announced plans to reduce the workforce at its Ladenburg plant from around 300 to 450.

The company, which had sales of almost DM300m (\$163m) in 1987 and net profit of DM3.5m, said the move is a knock-on effect of the dramatic decline in phosphate sales to the detergent and cleanser industries.

Since 1985, Benckiser-Knapsack has seen sales fall by DM-80m as a result of a trend to switch to phosphate-free detergents, despite rationalization moves and a shift towards production of phosphate specialities for technical applications and the food sector.

## R-P RAISES \$900M FOR ACQUISITIONS

Rhone-Poulenc has received government authorization to raise the capital it needs to finance its acquisitions programme, outlined recently by president Jean-Rene Fourtou.

Many projects are currently "in a delicate phase of negotiations," a company source said.

The state-owned group has raised over \$900m in new capital through the issue of perpetual notes with a number of international banks.

The move makes Rhone-Poulenc France's first nationalized business to have been given the means to raise its capital under the new socialist government.

## PACKING BAGS

We offer at reasonable rates with prompt delivery followings:

- H.D.P.E. WOVEN SACKS
- JUTE BAGS PLAIN
- JUTE BAGS LAMINATED
- POLYTHENE LINERS FOR BAGS/DRUMS

Please favour us with your enquiry:

## M/s. ANIL INDUSTRIAL SERVICES

Jolly Bhavan No. 2, 4th Floor, R.N. 407,

Executive Centre, 7, New Marine Lines,

BOMBAY-400 020.

Phones: 298583,294348,250955

Telex: 011-4220 FIRE IN



## Chemical Markets Abroad

### U.S. MTBE DEMAND CREATES EUROPEAN SHORTAGES

European MTBE consumers are facing a product shortfall at a time when it is acknowledged that the MTBE market is predominantly demand led.

This situation has arisen at a time when producers were expecting to increase output and so provide a competitive alternative to traditional octane boosters.

It has been projected that European demand will be up nearly 50 per cent this year on 1987 figures of 1.1m ton. The elimination of lead as an octane booster is being prioritized by European countries, this is behind MTBE's promising growth rates. An export-oriented 500,000 ton/year plant at Sabic's Ibn Zahn complex, which is expected on stream this month, and the 420,000 ton/year Fos-Sur-Mer, Arco plant due on stream at the end of the year should improve supplies to the European market.

The US market is having a greater influence on the present European MTBE shortage than expected. Soaring demand for octane boosters, on the back of strong demand for the higher grades of gasoline, has seen world spot MTBE prices soar to \$290/ton fob. A large amount of Brazilian product which would have found its way into Europe has been diverted to the US.

Contract MTBE prices in the US are being talked at a ratio of 1.6 times premium gasoline which is currently at \$180/ton. European contract prices are being dragged up to a ratio of 1.45 in response although buyers are reluctant to pay this price.

If the European market continues to tighten and price rises

follow, then sources believe refinery customers will increasingly turn to alternative octane boosters. Toluene spot prices have moved up to \$260/ton fob, largely because of higher US demand for octane giving an indication of the threat to MTBE from alternatives. Although there is little evidence of European gasoline pool customers switching to toluene, the threat is ever present.

In the long term, MTBE industry sources feel that as the European market expands, then the spot market should also increase. Enlarging the spot market should close the wide price gap between contract and spot levels, thus stabilizing the market. Analysts feel a less volatile spot market will convince refinery consumers that MTBE is a reliable product, compared with octane alternatives.

The massive changes that are expected in the European MTBE market in the next few years will mean a new set of rules will have to be developed. With over 1m ton of product coming on stream during the next year, largely aimed at Europe the market will be unrecognizable from its present state.

### INTEROX RAISES H<sub>2</sub>O<sub>2</sub> OUTPUTS

Interox, the Solvay-Laporte joint venture has increased its hydrogen peroxide capacity to nearly 400,000 ton/year with the start up of plants of associate companies in Brazil and Finland.

Peroxidos do Brazil has completed construction of an 11,000 ton/year peroxide unit at Curitiba while Finnish Peroxides has commissioned a second 15,000 ton/year line at Voikkaa. Capa-

city will be further increased next year when Interox America completes a second 20,000 ton/year peroxide plant at Longview in Washington. Finally, Peroxythai is currently constructing a 10,000 ton/year peroxide line at Mab Ta Phut, south of Bangkok, due on stream in mid 1990.

### CHINESE INCREASE PRODUCTION

China's chemical output jumped by 12 per cent during the first half of 1988 to reach Yen-33bn (\$9bn), according to figures from the country's chemical industry ministry. Despite the problems of raw material and electrical power shortages in China, 14 out of the 16 major chemical products exceeded 50 per cent of the state's annual plan.

Lowest growth was seen in the fertilizer sector-output of 7m ton was 7.6 per cent ahead of the year earlier period but caustic soda, soda ash, methanol and acetic acid all notched up gains of between 10 and 42 per cent.

The ministry warned, however, that higher prices for raw materials had increased the cost of many products and reduced profits for chemical manufacturers leading some enterprises to increase production at the expense of safety, and environment protection.

### CRACKER RESTART

Carmel Olefin's 130,000 ton/year ethylene cracker at Haifa in Israel has now restarted after being closed for several weeks due to technical difficulties.

The outage of ethylene interrupted supply to the company's 100,000 ton/year PE plant and a 75,000 ton/year PVC plant operated by Frutarom. Both have now resumed production.



ATTENTION  
EXPORTERS/INDENTORS/ ACTUAL USERS

For Your Regular Requirements Of :

**Fast Red B Base**

**Fast Scarlet R Base**

**Fast Scarlet G Base**

**Fast Bordeaux G.P. Base**

**Fast Scarlet RC Base**

also introducing OXALIC ACID shortly

Please Contact Manufacturers :

## **NANDOSAL INDUSTRIES**

Factory: Plot No. 4806 & 4807, GIDC, Ankleshwar-393 002.

Phone : 2882

Office: 7, Dharam Jyoti, 96, Kazi Sayed Street, Bombay-400 003.

Tel. No.: 339535

## **WANTED KNOW-HOW**

for the manufacture of the following :

1. Nickel Catalyst
2. Citric Acid
3. Vitamin C
4. Nickel Brightner & Additives and other electroplating chemicals
5. Laboratory LR & AR grade chemicals
6. Any other item which has large indigenous/export market or possibility of import substitution, with project outlay around 1.50 crores.

Write to :

**BOX NO. 2239**

C/o. CHEMICAL WEEKLY

306, Shri Hanuman Industrial Estate.

G. D. Ambekar Road, Wadala, Bombay-400 031.

**FOR YOUR  
QUALITY  
REQUIREMENT OF**

**P.V.A. EMULSION  
TEXTILE BINDERS**

**DETERGENTS**

**SILICON EMULSION**

**POLYETHYLEN EMULSION**

**SOFTENERS • RESINS**



**Shri-Gem Agencies**  
82/8, GIDC, PHASE-1,  
BE PUNJAB NATIONAL BANK,  
VATVA-382445, AHMEDABAD  
PHONE : 877242



## News from Japan

### MITI to Establish Many More Standards For Novel Materials

MITI is scheduled to energetically establish next fiscal year standards for novel materials in line with the "Sunrise Project" aimed at building up the foundation of novel-material operations.

To this end, it plans to form a liaison conference for novel materials, which will comprise related producers and users. This move is intended to combine and systematize work needed for establishing the said standards: such work is now being independently carried on by, for example, Japan High Polymer Center and Japan Fine Ceramics Association.

The planned conference is supposed to decide on terminology, unify test/assessment methods, establish novel-material standards and set up a relevant data base.

MITI also plans to form a novel-material standards office within the standards division belonging to its Agency of Industrial Science and Technology. At present the material-standards and fiber-standards sections, both attached to the division, are pushing forward standardization for metal-based and high-polymer/fine ceramics-based novel materials, respectively, but they are unable to completely deal with composite materials — which cannot be placed in conventional categories — and their work lacks efficiency.

In addition, the office will help private industrial groups beef up test/assessment methods for novel materials.

The MITI agency is actively promoting standardization for

and four items of the Japanese Industrial Standard (JIS) have been established for high-polymers and fine ceramics, respectively. It is believed that several ten more standards need to be newly established along with commercialisation of novel materials.

### L-LDPE Makers Building And Expanding Plants

Mitsubishi Petrochemical Co. Ltd. is to expand the capacity of its 80,000 — t/y L-LDPE (linear low-density polyethylene) plant to 100,000 t/y.

Having adopted Union Carbide Corporation (UCC; U.S.)'s unipol process, the company has been expanding sales and increasing production of L-LDPE.

Although supply of LDPE is insufficient throughout the world, L-LDPE is in even shorter supply than LDPE.

Mitsubishi Petrochemical, as the largest LDPE manufacturer in Japan, has been examining expansion of L-LDPE production. A supply of raw-material ethylene has now been secured, so the company has decided to increase L-LDPE production.

L-LDPE demand increased sharply because the product can be formed into thin films and extremely strong.

Consequently, Japanese LDPE manufacturers have been proceeding with construction/expansion plans for L-LDPE plant.

Nippon Unicar has increased L-LDPE production. HDPE manufacturers are concurrently manufacturing L-LDPE. Some

creasing L-LDPE production by removing the bottlenecks their plants have had.

In particular, shortage of raw material ethylene is preventing L-LDPE manufacturers from increasing L-LDPE production.

Thus, only those L-LDPE manufacturers who are able to secure an ethylene supply can increase L-LDPE production.

### 3 Phenol Manufacturers Expanding Plants

Mitsui Petrochemical Industries, Ltd., Mitsui Toatsu Chemicals, Inc., and Japan Phenol Co. have successively mapped out plant enlargement plans on a scrap-and-build basis to solve the bottlenecks their plants have.

Mitsui Petrochemical Industries, Ltd., is planning to increase the production capacity of its phenol plant by 30% (slightly less than 40,000 t./yr.) by the end of 1990 and as the first step, is considering raising it by 10% within 1989.

Mitsui Toatsu Chemicals will expand the capacity of its phenol plant by 20,-30,000 t./yr. with completion scheduled for next spring and Japan Phenol will raise its phenol plant's production capacity by 30,000 t./yr. within this year.

The three companies say that, since the expansion of their phenol plants will be on a scrap-and-build basis for solving the bottlenecks of their plants, the plant-and equipment investment required is small, and problems such as declining demand and increase in imported products in future will be solved by lowering the operation rate so that no sharp in-



## New Developments from Japan

### Unique Multilayered Coating Of Different Materials Possible

Nippon Steel Corp., the world's largest steelmaker, has developed a method enabling continuous multilayered coating of ceramics and metals on a substrate in a high-level vacuum condition ( $10^{-10}$ – $10^{-1}$  Hg). This is said to be a world first.

This has come about from the combination of three different coating methods — plasma CVD (chemical vapor deposition), ion-plating and sputtering. With the new method, it is possible to easily select a particular coating material from many different materials to satisfy a specific requirement and it is also possible to produce a composite coating, the company explains.

It hopes the new process will be applied to outer coating of construction materials, side protectors of cars and electrical appliances etc., using stainless steel as a base. It is operating an 8-t/m pilot plant at its Hikari factory and plans to expand capacity to a commercial scale if demand rises sufficiently.

### Insulating Film For Multiwiring Of VLSIs Jointly Developed

NEC Corp. and Chisso Corp. have jointly developed a polyimide film suitable for multilayer printing, which is indispensable to the development of very large scale integrations (VLSIs) of the next generation.

The film is produced through chemical bonding of polyimide resin and siloxane. It has good compatibility with inorganic insulating films including silicon-nitride film. And it also has a low rate of thermal expansion

The two firms envisage applying the new product to bipolar ICs as a first step. They claim that potential applications of the product are 16-megabit DRAMs and logic LSIs having several hundred thousand gates.

Development of VLSIs including 16-megabit DRAMs calls for linking of fine elements by means of a complicated wiring system. One of the promising linking methods is multilayer wiring, in which circuit wires are piled up in several layers with insulating films separating them.

Interlayer insulating films serve to ease unevenness resulting from wiring formed upon a film, which is put under the insulating film itself. When developing VLSIs, to achieve evenness of the insulating film is of the utmost importance.

### New Toshiba Lab Unveils Superconductivity Breakthroughs

Toshiba Corporation announced that researchers from its new advanced research laboratory have achieved three breakthroughs in the field of high-temperature superconducting ceramic materials.

The breakthroughs, which were announced by laboratory Senior Manager A. Kasami and Senior Researcher J. Yoshida, enabled Toshiba to fabricate a uniformly flat layer of yttrium barium copper oxide thin film without annealing, and to prevent the superconducting properties of the surface from deteriorating.

Using these two advances, the Toshiba researchers then created an experimental "tunnel junction" that when cooled with

liquid helium displayed the "superconducting tunneling effect," the flow of electrons across an insulator between two pieces of superconducting material.

In addition, they said they recorded the world's first observation of a large voltage jump, a phenomenon useful in switching devices, using superconducting ceramics.

Although it has been some time since the discovery of high-temperature superconducting ceramics, these materials have proved very difficult to fabricate into electronic devices because the high-temperature annealing process used in their manufacture causes deterioration between the film and substrate.

Also superconducting thin films made using the annealing process, which reaches a temperature of approximately 900°C, have a rough surface that is difficult to join other thin film materials and the superconducting properties of the top part deteriorate due to contact with air and moisture.

The Toshiba researchers said they have developed a new fabrication method, called "multi-target reactive sputtering", which alleviates the need for annealing.

In this method, yttrium, ceramic materials of barium and copper, and metallic copper are targets that are bombarded with an argon-oxygen gas mixture. The argon ions are excited by electrical energy, which strikes atoms from the target and forms layers of thin films up to 700 billionths of a meter onto substrates preheated to 560°C.

The resulting thin film which superconducts at 80 degrees Kelvin (minus 193°C) and con-



ects a current of roughly 1 million amperes per square centimeter, has a dislocation formation within 3% giving it a mirror like smoothness. In order to prevent the surface of the thin film from losing its superconducting properties and thus making the junction with other materials impossible, the researchers added a layer of silver to the surface for stability.

The silver layer was formed on the superconducting thin film through vacuum evaporation, after which it was annealed at 500°C while being supplied with oxygen. This creates a silver/silver-oxide layer that prevents oxygen from escaping from the thin film.

The Toshiba researchers said they confirmed the "proximity effect" in the silver layer that is the silver exhibited superconducting effects even though silver is not a superconducting material.

The experimental tunnel junction fabricated by the Toshiba researchers uses lead, a low-temperature super-conductor, which requires cooling with liquid helium. However, it did display the tunneling effect, which is a great step toward the realization of high-speed superconducting switching transistors.

Kasami said the development of practical devices based on superconducting ceramics is still 10 yrs. off with at least five more years required to gather basic data on interface characteristics that can be applied toward future multilayered devices.

He said Toshiba has applied for patents for a device structure with silver in both the U.S. and Japan, in addition to patents for the new sputtering equipment in Japan.

---

### Kirin Brewery Establishes Production Technology For Synthetic Seeds

---

Kirin Brewery Co. Ltd. recently succeeded in cultivating F1 hybrids, produced by means of synthetic-seed technology, of both celery and lettuce, in association with Plant Genetics Inc. of Davis, California, the U.S.

The main technologies applied in the process are: (1) Mass-Production technology for somatic embryos and (2) Encapsulating technology for the embryos. Mass-Production technology for rice somatic embryos has been established as well.

The process of cultivating F1 hybrid vegetables is as follows. First, somatic embryos of celery, or adventitious shoots of lettuce, are mass-produced from an explant source, which is a part of an F1 hybrid, by means of micropropagation in a small tank. Secondly, these embryos or shoots are directly transferred to a greenhouse and grown until they are plantlets, and these are then transplanted to undergo hydroponic culture or soil culture. In the other method, these embryos and shoots are grown until they are plantlets after encapsulation.

This is the first successful example in the world of accomplishing cultivation on this scale of F1 hybrids of celery and lettuce, from which it is considered difficult to produce F1 hybrids.

The mass-production technology for somatic embryos of rice applied here, as with celery and lettuce is also a world first. This technology has been licensed to Nursery Technology Co. Ltd., who will produce the rice tissue-culture plantlets on a commercial basis, using it as core technology.

These technologies were all developed in the process of R & D on synthetic-seed production technology. It will be possible to commercially produce with outstanding efficiency F1 hybrids, for which it is difficult to mass-produce seeds, and one superior plant in the course of breeding by using this mass-production technology for somatic embryos and adventitious shoots. The improvement in encapsulation technology is a big step forward in producing synthetic seeds for practical use.

From now on Kirin Brewery and Plant Genetics will individually continue R & D on: (1) Commercialisation of synthetic seeds and seedlings by reducing costs, (2) Development of synthetic seeds which can be sown directly in the fields and (3) enlarging the ranging of plant species to which the synthetic-seed technology can be applied.

---

### Radiosensitizer For Cancer Treatment Jointly Pioneered

---

Pola Cosmetics Co. and Kayaku Co., have jointly developed RK-28 hypoxic radiosensitizer designed to improve the efficacy of radiotherapy for cancer treatment.

The new product - 1 - (4, hydroxy - 2 butynoxymethyl) - 2 nitroimidazole is a new type water-soluble compound that will be subjected to phase-I clinical tests this fall.

After it is orally administered to patients, its concentration within their blood reaches a peak level in 30 minutes and it enters hypoxic cells existing in middle and deep parts of car-



cinoma, thereby improving their sensitivity to radioactive rays.

Radiotherapy is capable of producing the desired effect on the upper part of carcinoma in the presence of oxygen but cannot do so with the hypoxic middle and deep parts. Even if it temporarily shrinks carcinoma, cancer cells in the middle part often becomes active again and begin to propagate.

The two companies have obtained sufficient data on the effect of the new product by conducting preclinical trials using animal cells. The product is quickly metabolized and excreted from the human body, so there is no safety problem with it.

Conventional radiotherapy has a drawback in that carcinoma often returns because when radiation of radioactive rays exceeds the tolerable level, it has to be suspended before the carcinoma is completely removed. In addition, it also has such side effects as falling-out of a large amount of hair and destruction of normal cells. The new product is expected to overcome such disadvantages.

---

#### **Production Approval For Recombinant Erythropoietin Seen Being Sought**

---

Sankyo Co. and Kirin Brewery Co. are scheduled to jointly apply to the Ministry of Health and Welfare for production approval for erythropoietin (EPO) before the end of the year. They have conducted clinical tests on the product — erythropoiesis-stimulating factor — since the year before last.

They plan to call on the ministry to approve EPO as a remedy for renal anaemia. As a follow-up step, they will request it to authorize expansion of EPO application to blood production for patients who have undergone or are to undergo surgical operations.

Potential application of the product is limited to a cure for renal anaemia but the two companies are striving to expand it to the said field. If it is successfully expanded, the market concerned will markedly widen.

The targeted EPO is a recombinant product jointly developed by Kirin Brewery and Amgen (U.S.). The U.S. company has obtained a process patent covering the same product and has applied to the U.S. authorities for production approval for the product itself.

There are, however, patent troubles between the company and Genetics Institute (U.S.) which has a product patent on EPO and has tied up with Chugai Pharmaceutical Co.

In Japan, Toyobo and Chugai Pharmaceutical are also conducting clinical trials on EPO but they are lagging behind Sankyo and Kirin Brewery.

---

#### **Titanium Alloy Applied To Artificial Teeth Base**

---

Sumitomo Metal Industries Ltd., together with Sankin Industry Co., an Osaka-based producer of dental materials — has developed a titanium-applied artificial teeth base using superplasticity processing technology. Sankin is scheduled to start marketing the product this fall,

with approval already obtained from the Ministry of Health and Welfare.

The new product is lightweight, free from metallic odor and has strong corrosion resistance and good compatibility with the living tissues of the human body. It is possible to precisely adjust the product to the palate: the gap between the product and the palate is 80 microns, much smaller than the gap in the case of conventional artificial teeth bases.

The new teeth base is produced by heating 0.5 mm — thick titanium alloy sheet (titanium 90%; aluminium, 6% and vanadium, 4%) to 850-900°C (superplasticity temperature zone) and forming the resultant product by means of argon-gas pressure. The superplasticity processing technology concerned has been employed for manufacture of titanium-alloy parts of airplanes but the two companies are the first to utilize it for the production of consumer products.

MMA resin and cobalt-chromium/nickel-chromium alloys have been used as artificial teeth bases but they have drawbacks in thickness, low thermal conductivity and elution of nickel, which may cause allergy. Cast titanium bases are partly employed but often have pinholes, which tend to hold drugs and result in breakage of the bases themselves.

Japan's annual demand for artificial teeth bases reaches 3 million pieces. It is projected to reach 7 million pieces along with the increase in the number of aged people.



# MARKET INFORMATION

## Solvents Come Down

PCL and BPL have started releasing Xylene and Benzene with the result the prices have come down by Rs. 3/- per litre. Due to non-availability of ready goods PVA (173) and Go-

hsenol (GH-17) the prices have gone up by Rs. 5/- per kg. Rangolite (German) is ruling Rs. 90/- per kg and Sodium Alginate Rs. 160/- per kg.

Dyes Intermediate section MPD is

We cannot guarantee the accuracy of the prices published in CHEMICAL WEEKLY as they are based only on the enquiries made by our correspondent — and, as such they are not FIRM PRICES as between a buyer and seller. The prices are published only with a view to giving some ideas of market conditions.

The prices are inclusive of Excise and Maharashtra Sales Tax.

is still in short supply even Tobias Acid Sulpho Tobias Acid and Sulphanilic Acid are tight.

(Prices as on 11th August 1988)

INDUSTRIAL CHEMICALS	Per kg.				
Ammonium sulphate	2.00	Borax (Granular)	13.50	Calcium Carbonate PPT	3.00
Ammonium phosphate (Mono)	14.50	Borax (Powder)	21.00	Calcium carbonate (Activated)	3.55
Ammonium phosphate (Di)	12.00	Boric acid (Tech.)	22.00	Camphor (Indian)	82.00
Ammonium carbonate (Di)	17.00	Bisphenol-A	71+ST	Cresylic acid	50.00
Ammonium bicarbonate	4.75	Butyl carbitol	48.00	Cream of Tartar (Tech.)	70.00
Ammonium chloride	3.00	Caustic soda (Flakes)	9.20	Citric acid (Belgium) (Resale)	43.00
Ammonium nitrate	3.50	Caustic soda (Solid)	8.00	Citric acid (Indian) (Resale)	42.50
Barium white powder	11.00	Caustic soda (Lye)	7.00	Copper sulphate	21.00
Caprolactam (Resale)	88.00	Calcium chloride 70% (solid)	3.25	Chromic acid	48.00
Calcium carbonate	6.00	Calcium chloride 75-80% (fused)	3.60	Cyanuric chloride	120.00
Washing powder (33% Cl)	4.00	Calcium chloride 36% (Anhydrous)	5.00	Cobalt oxide	280.00
				Carbitol	60+ST

CHEMICALS

FERTILIZERS

SUGAR, CEMENT

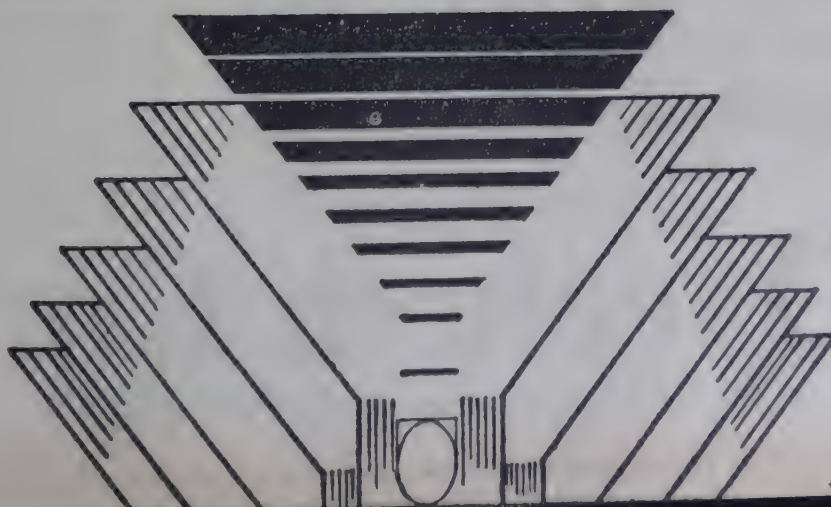
PHARMACEUTICALS

DYES & INTERMEDIATES

OTHER INDUSTRIES

In the multifarious world of industrial filtration, one name strikes the right chord

**PROFIL®** FILTER FABRICS



- Wide Range: Polypropylene, Cotton, Polyester, HDPE, Spun and Multifilament.
- Made to order: Filter fabrics that are processed, fabricated and sized exactly to your machine's specifications.
- Extensive distribution facilities.
- Guaranteed quality and prompt after sales service

**KHOSLA FILTERS PRIVATE LIMITED**

Head Office 3/623, Navjivan, Lamington Road, Bombay-400 008.  
Phones 897012 • 897320  
Grams KHOFIL Telex 011 76790 ID IN



Indication  
better  
filtration



Ethylene urea	56.00	Sodium sulphate (Fine)	6.00	Butyl stearate	36.00
Ferric chloride (Lumps)	7.00	Sodium sulphate (Coarse)	5.00	Butanol	(Resale) 35.00
(Anhydrous)	16.00	Sodium sulphide 50-52%	11+ST	Benzyl Alcohol	60.00
Glue flakes	8.45	(Flakes)		Benzyl chloride	34.00
Glue sheets	6.75	Sodium sulphide 58-60%	19.00	Benzo trichloride	16.00
Gohsenol GH-17	140+ST	(Flakes) (TCL)		Benzoyl chloride	22.00
Hydro	(Resale) 41.50+ST	Sodium sulphide pure (Flakes)	12.25	Bromine Liquid	42.50
Hyflosupercell	24+ST	Sodium nitrite (Resale)	700.00	Chloroform	25.00
Hexamine	(Resale) 35.00	Sodium chlorite 80% (Spain)	90.00	Carbon Tetrachloride	17.00
Industrial Wax	25.00	Santobrite (Indian)	36.00	Cellosolve	45+ST
Litharge	15.00	Soda Ash (Tata)	4.00	Cyclohexanone	53+ST
Lead Acetate (Tech)	28.00	Soda Ash (Birla)	3.80	Cyclohexanol	43+ST
Lithopone	15.50+ST	Soda Ash (Imp.)	3.50	Diacetone	(Resale) 35.00
Magnesium chloride (Crystal)	1.00	Sodium bicarbonate	5.25	Diethyl Oxalate	34.00
Menthol crystal (Flakes)	185+EX.+ST	Sodium bisulphite	4.50	Diethylene glycol (DEG)	46+ST
Menthol bold	205+Ex.+ST	Sodium silicate	3.00	Dioctyl Phthalate	52.00
Menthol crystal bold	245+Ex.+ST	Sodium acetate	6.00	Diallyl Phthalate	56.00
Magnesium carbonate (Japan)	16.00	Sodium alginate	160+ST	Dimethyl Phthalate	28.00
Magnesium carbonate (Indian)	15.00	Titanium Dioxide (Anatase)	55+ST	Dioctyl Adipate	52.00
Maleic Anhydride (per kg)		Titanium Dioxide		Dibutyl Adipate	42.00
(Resale)	55.00	(Rutile — RCR <sub>2</sub> )	70+ST	Dipentene	15.00
Mercury (75 lbs.)	10500.00	Tartaric acid (Crystal)	94.00	Dimethylamine 40%	12.00
Nickel chloride	90.00	Trisodium phosphate	4.80	Dimethylamine 60%	14.00
Oxalic acid	(Resale) 22.00	Thiourea	78+ST	Ethyl Acetate	19.00
Peppermint oil (Rectified)	90+Ex.+ST	Urea (Tech)	2.75	Ethyl Acrylate	54.00
Potassium carbonate (Indian)	19.00	Zinc Dust	30.00	Ethylene Dichloride	11.00
Potassium carbonate (Imported)	23.00	Vacuum salt	1.00	Ethylene Glycol	45+ST
Potassium bichromate	22.00	Zinc Oxide	30.00	Formic Acid (Imp)	(Resale) 29.00
Potassium phosphate (Mono)	14.00	Zinc chloride powder		Formaldehyde	(Resale) 6.00
Potassium phosphate (Di)	14.00	(technical)	14.00	Glycerine (CP)	53.00
Polyvinyl alcohol (No. 117)	120+ST	Zinc sulphate	4.00	Glycerine (IW)	48.00
Polyvinyl alcohol (No. 173)				Hydrogen peroxide 50%	
(Resale)	135+ST			(Resale)	29.00
Polyvinyl alcohol (No. 208)	150.00	<b>SOLVENTS</b>	<b>Per kg.</b>	Isopropyl Alcohol	21.00
Paraformaldehyde (Resale)	20+ST	Acetic Acid (Glacial) (Resale)	17.00	Iso Butyl Alcohol	28.00
Phthalic anhydride 36%		Acetic Anhydride (Resale)	25.00		(Resale) 30.00
(Resale)	24.00	Acetone (Resale)	16.00	Monoethanolamine	(Resale) 52.00
Pentaerythritol	(Resale) 51.00	Adipic Acid	55+ST	Melamine	50+ST
Paraffin wax	(Resale) 14.50	Aceto Acetanilide	50.00	Methyl Ethyl Ketone	55.00
Rangolite (German)	96+ST	Aniline Oil	(Resale) 50.00	Methyl Isobutyl Ketone	36.00
Rangolite (Czech.)	54+ST	Benzoate Plasticiser	45.00	Methyl Acrylate	42.00
		Butyl acrylate	88+ST	Methyl Dichloride (Resale)	23.00

FOR YOUR REGULAR REQUIREMENTS OF :

# Sodium Naphthionate

(Mfd. by: ARUN CHEMIDYES P. LTD.)

## ACRYLIC DYES

(For Acrylic Yarn; Cationic)

## Sodium Sulphide Flakes

58-60%

Contact:

All types of  
Dyes,  
Chemicals  
& Solvents.

# Gohil Dyechem Corpn.

211/212, Anand, 82/84, Kazi Sayed Street, Bombay-400 003.

Gram : GOHILCHEM

Tele: 346191, 324515



# IN GOD WE TRUST

For Excellent Quality & Regular Guaranteed Supplies At Competitive Rates :

CALCIUM STEARATE

MAGNESIUM STEARATE BP 80

ZINC STEARATE

ALUMINIUM STEARATE

COPPER SULPHATE IP

DRIED ALUMINIUM HYDROXIDE IP

MAGNESIUM HYDROXIDE POWDER IP

ZINC CARBONATE

AND OTHER LABORATORY CHEMICALS.

Contact Manufacturers & Exporters :

## ARUN INDUSTRIES

303-A, Vrindavan, Ramachandra Lane, Malad (West), Bombay-400 064.

Phone : Office : 6820559/6820422

Telex : 011-78081 ARUN IN

Gram: "DEVOTION"

WE ARE REGISTERED WITH D.G.S. & D

For Your Regular Requirement Of :

- ★ Beta Naphthol
- ★ Sodium Sulfate 65% Purity
- ★ Sodium Sulfite 70% Purity
- ★ Tar Pitch

Please Contact :

### M/s. Souvenir Chemicals Pvt. Ltd.

F-8, Vatsalya Chamber,

31, Sneh Nagar Main Road, INDORE (M.P.).

Tlx No.: 0735 349 BNPL IN

Phone : 61984

New Delhi

Phone: 770433

Bombay

Tlx No.: 011-75070 BABA IN

Phone: 344339/322420

Ahmedabad

Phone: 409953

Surat

Phone: 47708

For Your Requirement Of :

ACETONE / IPA / MEK /

MIBK / IBA / NBA / ISO AA (Recovered)

XYLENE / BENZENE / TOLUENE / METHANOL / HEXENE (Recovered)

LDC / TCE / CTC / MDC / MEG / DEG (Recovered)

METHYL ACETATE / ETHYL ACETATE / ETHYL ACETONE /

ISO-PROPYL ACETATE

DOP / DIOP / DBP / PARAFORMALDEHYDE 91%.

We also buy spent solvent and waste solvents.

We also undertake distillation job work.

Please Contact Mfr. :

### M/s. SHREE CHEM INDUSTRIES

2/4, Kubal Nivas, Gokhale Road (N).

Dadar, Bombay-400 028.

Telephone : 456868



Meta Cresol	45.00
Nitrobenzene	18.00
Nitric Acid (Con) (RCF)	2.50
Ortho Cresol	30+ST
Phenol (Resale)	36.00
Propylene Glycol	41+ST
Polyethylene Glycol (No. 200)	39.00
Polyethylene Glycol (No. 400)	42.00
Polyethylene Glycol (No. 500)	42.00
Polyethylene Glycol (No. 1600)	14.00
Polyethylene Glycol (No. 4000)	38.00
Polyethylene Glycol (6000)	50.00
Para Cresol	40.00
Styrene monomer	46+ST
Sorbitol	16.00
Sulphuric Acid	2.50
Trichloroethylene	28.00
Triethanolamine (Resale)	49.00
Turpentine Oil (German)	8.00
Turkey Red Oil (50%)	11.75
Triethylamine	50.00
Vinyl Acetate Monomer	43.30

SOLVENTS	Per Litre
Benzene	19.00
N-Heptane	8.00
N-Hexane	8.75
Methanol	8.00
Solvent Naphtha Heavy	10.50
Solvent Naphtha Light	8.50
Toluene	21.00
Xylene	19.00

# **DYES INTERMEDIATES (PRICES ARE WITHOUT TAX AND EXCISE)**

Alphanaphthylamine	60.00
Alpha Naphthol (Imp.)	185.00
Aceto Acetic Ester (Methyl)	60.00
Ammonium Molybdate	200.00
Anthraquinone	100.00
Anthranilic Acid	60.00
2-Amino-4-Nitrophenol (Imp.)	140.00
Blue B. Base (Local)	230.00
Beta Naphthol (Atul)	58.00
Benzidine Dihydrochloride (BDH)	80.00
Bromamine Acid	400.00
BON Acid	120.00
Chicago Acid	280.00
Coach Acid	58.00
C. Acid (Imp.)	260.00
Cyanuric Chloride (Japan)	120.00
2, 4, DNCB	29.00
Dihydrothio PTOS (Imp.)	600.00
Dimethyl Aniline	69.00
Diethyl Aniline	160.00
Di-amine stilbene disulphonic acid	125.00
3, 3-DCB (Imp.)	180.00
Gamma Acid (Atul)	170.00
H. Acid (Atul)	155.00
G. Salt	60.00
Isophthalic Acid	45.00
J. Acid	260.00
J. Acid Urea	290.00
K. Acid	105.00
MDPS (German)	190.00
MNA	90.00

Meta Unido Aniline	155.00
MPD (Local)	150+Ex.+Tax
MPD (Japan)	220.00
Naphthenic Acid	12.00
N-Methyl J. Acid	180.00
N-Methyl Aniline	120.00
Naphthalene (Refined)	23.00
Ortho Anisidine (QA Imp.)	85.00
Ortho Dichloro Benzene (ODCB)	11.25
OT Base	100.00
Para Dichloro Benzene (PDCB)	17.00
Para Anisidine (PA-Imp.)	110.00
Para Anisidine (PA-Local)	90.00
PNA	70.60
Para Cresidine (Imp.)	335.00
Para Amino Azo Benzene (India)	130.00
PNCB	34.00
Para Amino Acetanilide	145.00
1-Phenyl 3-methyl-5-Pyrazolone	120.00
Phenyl J. Acid	345.00
Para Amino Benzoic Acid	170.00
PT Base	88.00
Rhoduline Acid	500.00
Resist Salt	22.00
Resorcinol	145.00
Sodium Naphthionate	65.00
5-Sulpho-Anthranilic Acid	64.00
Sulphanilic Acid	27.00
Sulpho Tobias Acid	120.00
Trichloro Benzene (TCB)	21.00
Tobias Acid	128.00

NOW AVAILABLE! ANY QUANTITY,  
AS AND WHEN REQUIRED BY YOU

## **MONO-CHLORO ACETIC ACID**

When it comes to chemicals, we care a little extra. Making sure to produce chemicals that meet exacting standards of quality, purity and reliability. Backed by research and thorough testing. Our customer service can help you improve your present products and develop new ones. And remember, we can meet your requirement in bulk whenever and wherever you want. Why not try?

We manufacture: N.I.A. • E.D.I.A. & its salt • S.M.C.A. • Sodium Acetate & Hydrochloric Acid.

We market: Acetic Acid • Acetic Anhydride • Butyl & Amyl Alcohol • Ethyl & Butyl Acetate Acetaldehyde • Paraldehyde • D.B.P. • D.E.P.

**ashok organic  
industries Ltd.**

Regd Office: 408 Sharada Chambers,  
33 New Marine Lines, Bombay 400 028.  
Phones: 252236-252258 • Telex: 011-3850  
Formerly Nandawari Dist. Sarad, Phone: 171-67



FOR YOUR REQUIREMENTS OF :

ZINC DUST

POLYSOL

ZINC CHLORIDE (Powder &amp; Solid)

IRON POWDER

ZINC OXIDE (Rubber Grade)

ALUMINIUM STEARATE

Please Contact :

**SARSHILA CHEMICALS**

187, Sherif Devji Street, 1st Floor,

R. N. 8, BOMBAY-400 003.

Phones : 333854/333864

Available on Regular Basis

BEST QUALITY AT MOST COMPETITIVE RATES

- E.D.T.A., N.T.A. and their Salts
- E.D.T.A. TETRA SODIUM SALT SOLUTION OF DIFFERENT CHEALATION VALUE
- SARCOSINE 32% CONC.  
(Methyl Amino Acetic Acid)  
Stabilizer for RAPIDOGEN COLOURS

Contact Manufacturers :—

**PARSHWANATH INDUSTRIES**

1622, G.I.D.C. Phase II, CHHATRAL,  
Tal. Kalol, Dist. MEHSANA (N. Guj.).  
Telephone : 463096 (Ahmedabad)

(KNS-ADI)

A RELIABLE & DEPENDABLE HOUSE FOR CHEMICALS & SOLVENTS  
PARTICULARLY FOR

**CAUSTIC SODA LYE**

(In Tanker Loads)

&amp;

**MAGNESIUM SULPHATE**

(Commercial &amp; Anhydrate)

(In Truck Loads)

Consumers Kindly Contact :

**PURCHASE & SALES EXCHANGE**

345, Samuel Street, BOMBAY-400 003.

Telephones: 327129/341105/6837582

Cable : DIXITCO, Bombay-3

ESTD.: 1955



(Prices as on 11th August 1988)

<b>ACID COLOUR</b>	<b>Per Kg.</b>	Brill. Violet Extra	126.40	Scarlet RR	214.80
Acid Violet 4BS	143.00	Blue 2B	86.60	Rubine 3B	223.00
Acid Maroon V	110.00	Blue G	170.50	Rubine CB	364.90
Acid Orange II	77.80	Sky Blue FB	188.25	Blue GL	318.90
Acid Orange IIV	63.05	Copper Blue GR	147.00	Blue BGF	636.50
Acid Red A	107.25	Fast Greenish Blue GL	114.60	Navy Blue RF	270.40
Crosein Scarlet MOO	155.00	Developed Black BT	116.10	Brown 3REL	200.40
Acid Scarlet 3R	99.90	Blue NB-2B	300.20	Black GEL	324.20
Acid Red 38N	135.00	Blue NB-2BC	185.30	Dark Brown SB	317.40
Acid Red R2R	132.00	Developed Black NB-GHB	185.30		
Acid Red RS	88.00	Green B	111.65	<b>BASE COLOURS</b>	<b>Per Kg.</b>
Acid Green V	230.00	Green NB-B	188.25	Fast Yellow GC	80.20
Acid Patent Blue AB	250.00	Green 2B-N	188.25	Fast Orange GC	135.43
Acid Coomasi Blue	200.00	Brown MR	154.40	Fast Scarlet R	166.90
Acid Yellow 5GN	65.00	Brown CN	107.25	Fast Scarlet RC	126.65
Acid Red PG	85.00	Golden Brown G	140.35	Fast Scarlet RCR	99.05
Acid Red GRS	78.00	Catechin G	120.50	Fast Scarlet G	121.85
Acid Black 10 BX	121.95	Omega Tan	126.40	Fast Scarlet GN	91.50
Acid Black BX	98.40	Catechin GS	102.80	Fast Scarlet GG	72.70
Acid Black Wax	135.50	Black E Hly Conc.	142.60	Fast Scarlet GGS	72.75
Procinil Yellow GS		Black E Extra Hly. Conc.	142.60	Fast Red B	203.20
(ICI, UK)	265.00	Black NB-ER Hly. Conc.	310.50	Fast Red RC	119.15
Procinil Red GS (ICI, UK)	530.00	<b>DISPERSOL COLOURS</b>	<b>Per Kg.</b>	Fast Red R Flakes	149.25
Procinil Blue RS (ICI, UK)	315.00	Yellow 6G Powder	143.80	Fast Red TR	166.80
Procinil Scarlet G		Red B 3B Powder	247.80	Fast Red TR Oil	183.15
(ICI, UK)	600.00	Red B 2B Powder	323.20	Fast Red RL	237.10
Procinil Orange G		Red CB Powder	439.15	Fast Red KB Oil	201.90
(ICI, UK)	250.00	Red D2B Powder	477.40	Fast Bordeaux GP	201.95
Procinil Rubine (ICI, UK)	550.00	Violet C 4R	521.90	Fast Garnet GBO	94.00
<b>DIRECT COLOURS</b>	<b>Per Kg.</b>	Blue BG Powder	235.45	Fast Violet B	505.60
Yellow 3GX	88.10	Blue BN Powder	103.75	Fast Blue BB	521.40
Gun Yellow RCH	124.00	Blue D 2R Powder	476.25		
Fast Yellow GCH	141.15	Navy BT Powder	243.90	<b>NAPHTHOL COLOURS</b>	<b>Per Kg.</b>
Yellow CFG Hly. Conc.	312.00	Blue B 2G Powder	210.20	ASG	217.00
Fast Yellow GS	111.65	Black BT Powder	182.60	AS	143.00
Fast Yellow CHRS	95.45	Blue BR Powder	390.20	ASSW	279.75
Viscose Orange A	166.15	Yellow 7GL	338.60	ABBS	180.15
Fast Orange GR	133.75	Yellow 5RX	218.80	ASBO	195.65
Red	96.90	Yellow 3G	367.25	ASD	175.30
Dark Tan	78.25	Yellow	140.00	ASOL	179.35
Red IIR	72.55	Yellow AL	135.30	ASTR	279.75
Red 4B	169.10	Yellow Brown REL	247.50	ASPH	279.75
Bordeaux BW	132.30	Yellow FFL	463.60	ASE	196.05
Fast Scarlet 4BS	166.55	Gold Yellow GO	259.70	ASEI	184.40
Red 12B	170.55	Pink REL	247.00	ASLB	1632.60
Bordeaux Hly. Conc.	194.00	Red REL	468.65	ASBT	1817.00
Cotton Red N	117.05	Red 2B	327.40	ASWG	143.00
Brill. Fast Helio B	278.00	Red FB	324.20	ASSG	397.70
Brill. Fast Helio 2B	297.00	Red Violet FBL	469.85	ASSR	480.50
Brill. Fast Helio 2RS	136.20	Orange 3R	196.65		
Brill. Fast Helio BS	116.10	Violet 3R	280.00		
		Violet RL	275.45		
		Violet 6R	485.75		



PROCION COLOURS		Per Kg.			
Golden Yellow HR	181.80	Navy Blue M 3R	310.95	Blue R Conc. Pdr. Fine	577.65
Brill. Yellow H4G	117.85	Brill. Blue MR	331.70	Blue RR Supra Powder	629.35
Supra Yellow H-8GP	168.55	Brill. Blue M RX	214.20	Blue Conc. Powder	645.80
Brill. Yellow HE6G	166.95	Brill. Blue M-G	382.30	Brill. Blue 2R Hly. Conc.	378.58
Yellow H-E4R	276.05	Blue M 4GD	344.60	Brill. Blue 2R Supra Disp.	115.65
Brill. Yellow H7G	332.30	Navy Blue M RB	318.75	Dark Blue 2R Powder Fine	389.25
Yellow M4R	243.95	Turquoise M-G	197.85	Blue BC Supra Disp.	359.40
Yellow M GR	326.05	Brill. Blue M GX	302.50	Jade Green XBN Powder Fine	438.20
Brill. Yellow M4G	177.10	Blue 3R Acra Powder	718.20	Jade Green XBN Acra	
Brill. Yellow M8G	332.30	Dark Brown H 6R	248.45	Conc. Powder	823.96
Yellow M 3R	217.60	Cobalt Oxide (per kg.)	285.00	Jade Green 2G Pdr. Fine	419.65
Brill. Orange H 2R	241.85	Green H 4BD	269.80	Jade Green 2G Ptg. Paste	125.40
Brill. Red H 7B	157.93	Green H-E4BI	169.80	Jade Green XBN Ptg. Paste	128.00
Brill. Orange M 2R	313.15	Red Brown H 1F	143.25	Jade Green 2G Supra Disp.	496.00
Brill. Red H 8B	169.45	Orange Brown H 2B	209.05	Olive Green B Pdr. Fine	399.90
Brill. Scarlet H RN	245.05	Brown M GRN	188.80	Olive D Pdr. Fine	444.30
Supra Red H-3BP	179.30	Black H-N	283.35	Olive Green B Supra Disp.	308.26
Brill. Red H-F3B	243.45			Jade Green XBN Supra	
Brill. Magenta HB	167.00	SULFUR COLOURS	Per Kg.	Disp. (N)	327.30
Brill. Red M 5B	98.90	Navy Blue	99.85	Olive OMW Pdr. Fine	698.55
Brill. Red M 8B	173.70	Green G	198.55	Olive OMW Supra Disp	538.05
Brill. Pink MB	137.10	Black Grains Extra	63.05	Olive R. Pdr. Fine	422.96
Brill. Magenta MB	121.55	Black Grains OG	64.55	Olive D Supra Disp.	361.70
Brill. Purple H-3R	180.20	Black GXE Conc.	61.60	Olive R Supra Disp.	363.90
Brill. Purple H-7R	175.40	Black GXE	52.75	Olive D. Ptg. Paste	193.00
Navy Blue H 3R	298.50	Black GXR	61.60	Olive Green B. Ptg. Paste	199.10
Brill. Blue H-GR	366.55	Black Grains 800	54.20	Olive Green B Acra Conc.	542.75
Brill. Blue H 5G	173.10	Black EXR Grains	64.55	Olive R Acra Conc.	640.00
Blue H 5R	283.85	Black EXR Grains 800	51.25	Olive Green B Acra Conc.	542.75
Brill. Blue H 7G	178.70			Brown R Pdr. Fine	835.00
Brill. Blue H 7RX	358.15	VAT COLOURS (ICI)	Per Kg.	Brown G. Pdr. Fine	795.00
Turquoise HA	234.45	Yellow 5G Powder Fine	673.15	Brown R Pdr. Fine	659.75
Supra Blue H-3RP	335.70	Yellow 5G Supra Disperse	439.30	Dark Brown 3R Pdr. Fine	685.00
Supra Turquoise H 2GP	181.50	Yellow 5G Acra Con.	628.75	Brown G. Supra Disp.	449.90
Blue H-ERD	305.80	Yellow 3R Powder	588.85	Brown 2G Supra Disp	554.00
Navy Blue H ER	258.60	Gold Orange 3G Pdr. Fine	952.15	Brown R Supra Disp	422.95
Blue H 5RX	269.30	Brill. Orange 6R Pdr. Fine	624.35	Brown BR Powder	719.00
		Gold Orange 3G Supra Disp.	601.30	Dark Brown 3R Ptg. Paste	217.15
		Brill. Orange 6RX Powder	394.30	Dark Brown 3R Supra Disp.	414.55
		Brill. Red 3B Pdr. Fine	997.80	Brown G Acra Conc	733.95
		Brill. Red 3B Supra Disp.	713.20	Brown R Acra Conc.	766.00
		Brill. Purple 4R Conc. Pdr.	470.75	Grey M. Powder Fine	768.80
		Brill. Purple 3R Acra Powder	690.85	Grey M. Supra Disp.	585.45
		Brill. Purple 2R Hly Conc.	597.90	Blue BC Acra Conc. Pdr. Fine	762.70
		Brill. Purple 4R Supra Disp.	500.05	Direct Black AC Supra Disp.	330.35
		Brill. Purple 2R Acra Conc.	625.95	Direct Black AC Pdr. Fine	474.70
		Blue R Powder Fine	542.15	Direct Black CH Supra Disp	393.20
		Blue BC Conc. Pdr. Fine	522.50	Direct ACD Ptg. Paste	217.15
		Blue BC Acra Conc. Pdr. Fine	762.70		



## Delhi Market

**DELHI: AUGUST 12 (NNS)** — Menthol prices spurted sharply by Rs. 17/30 per kg. in the Delhi chemicals market during last week, on account of heavy demand shown by stockists and exporters and fall in arrivals from UP, reports NNS. Citric acid also advanced by Rs. 50/100 while caustic soda flakes and tartaric acid resumed lower on fall in demand. Turnover was moderate.

Menthol medium and bold jumped up sharply by Rs. 30 each at Rs. 255 and Rs. 265 per kg. respectively, due to restricted arrivals from Uttar Pradesh along with brisk purchasing made by stockists and exporters. Menthol flakes also shot up by Rs. 17 at Rs. 222 per kg on stocking tendency. Mentha oil moved up by Rs. 10 at Rs. 175.

Camphor thal jumped up by Rs. 2 at Rs. 102 due to tight supply from manufacturers along with heavy demand for ensuing festivals. Camphor powder improved by Re. one at Rs. 88. Acetic acid glacial firmed up by rupee one at Rs. 14/14.50 on poor inflow.

Citric acid advanced by Rs. 50/100 at Rs. 2100/2400 on reduced supply from Bombay Dyeing. Tartaric acid

softened by Rs. 25 at Rs. 6000 per 50 kg. on slack demand due to rains. Caustic soda flakes, however was cheaper by Rs. 2/5 at Rs. 398/400 on easy supply.

Paraffin wax locked up by Rs 10 at Rs 64 per kg on poor supply from Assam due to floods. Ammonia bicarb also moved up by Rs 5 at Rs 135 on brisk buying by bakeries.

Titanium dioxide Anatase and RC-822 were traded at Rs 56 and Rs 74 per kg. with support from the buyers. Formic acid increase by Rs 10 at Rs 900 (per 50kg.) on sustained demand.

Among dyes and colours, Naphthol AS, ASG, ASBS, ASTR, ASOL, and ASBO prices went up sharply by Rs. 8/14 per kg. caused by hike in its prices by companies. Similarly Black E Conc, Diazo black BT and green B and Blue B-2 quoted higher by Rs. 5/8 per kg. on due to hike in its prices by manufacturers. Sky Blue FB hardened from Rs. 200.15 to Rs. 213, and Basic Auramine sold higher at Rs. 110 against Rs. 100. Basic Malachite green, however, dropped by Rs. 20 at Rs. 140/165. Acid orange sold higher at Rs. 45/88 per kg, on good enquiries by consumers.

### (DELHI MARKET RATES AS ON AUGUST 12, 1988)

Ammonia Bicarb (per 25 kg)	135.00
Mercury (per flask)	11,000.00
Soda ash (per bag)	270-300.00
Ammonium chloride (per 50 kg)	125-180.00
Caustic soda solid	No Stock
Caustic soda flakes (per 50 kg)	398-400.00
Citric acid (per 50 kg)	2100-2400.00
Stable Bleaching Powder Shriram (per 25 kg)	95.00
Stable Bleaching Powder KCl (per 25 kg)	86.00
Stable Bleaching Powder MODI (per 25 kg.)	88.00
Sod. Bicarbonate (per 50 kg)	265-275.00
Sod. Hydro Sulphite (per kg)	38-43.00
Rangolite (per kg)	50-70.00

Boric acid Technical (per 50 kg)	1015.00
Paraffin wax (per 50 kg)	640.00
Tartaric acid (per 50 kg)	6,000.00
Borax Granular (per 50 kg)	550.00
Borax Crystal (per 50 kg)	575.00
Sodium Nitrate (per 50 kg)	430.00
Sodium Nitrite (per 50 kg)	675-700.00
Camphor Powder (per kg)	88.00
Camphor Thal (per kg)	102.00
Menthol Medium (per kg)	265.00
Menthol Flakes (per kg)	222.00
Menthol Bold (per kg)	265.00
Glycerine (per kg)	47-48.00
Sodium Silicate (per quintal)	200-250.00
Hexamine (per kg)	42.00
Acetic Acid Glacial (per kg)	14-14.50
Copper Sulphate (per quintal)	2100-2300.00

Formic acid (per kg)	26.00
Formaldehyde (per kg)	8.00
Hydrogen Peroxide (per kg)	27-29.00
Calcium Carbonate (per tonne)	2500-4000.00
Acid Slurry Soft (per kg)	24.00
Acid Slurry Hard (per kg)	32.00
Phosphoric Acid (per 50 kg)	900.00
Pot. Nitrate (per quintal)	900-1200.00
Pot. Permanganate (per 50 kg)	2300.00
Sod. Bichromate (per 50 kg)	1050-1150.00
Tri-Sod. Phosphate (per 50 kg)	350-380.00
Titanium Dioxide Anatase (per kg)	56.00
Titanium RC-822 (per kg)	74.00
Zinc Oxide (per mt)	35,000-42,000.00
Phenol Carbollic Acid (per kg)	33.00
Carbon Tetrachloride (per kg)	20.00
Chloroform (per kg)	28.00
Sodium Sulphate (per 50 kg)	160-170.00
Naphthalene Balls (per 50 kg)	1350.00

### DYES & COLOURS (per kg)

Naphthol AS	158.00
Naphthol ASG	249.00
Naphthol ASBS	210.00
Naphthol ASTR	320.00
Naphthol ASOL	202.00
Naphthol ASBO	220.00

### DIRECT DYES (per kg)

Black E. Conc.	110-160.00
Diazo Black MT	105-130.00
Green B	100-127.00
Blue 2-B	60-92.00
Sky Blue FB	213.00
Basic Auramine	55-110.00
Basic Rhodamine	220-320.00
Basic Methylene Blue	92-130.00
Basic Violet	142-160.00
Basic Malachite Green	140-165.00
Acid Orange	45-88.00



## Madras Market

There was good activity during the week. Acetic acid prices spurted on the news that the demand from PTA manufacturer is good and this has resulted in a shortage. Hydros prices based on good supplies from manufacturers. Petroleum solvents like benzene, toluene and xylene continues to

be under short supply. The continued strike at Hindustan Lever Bombay unit has affected Glycerine availability substantially and the prices are ruling high. In the Dyes section vat prices have gone up on reported shortage due to exports.

### (MADRAS MARKET RATE AS ON AUGUST 13, 1988)

Acetic Acid Glacial (per kg)	18.75	Hydrosulphite of Soda — TCPL (per kg)	39.00
Aluminium Sulphate Iron Free (per MT)	1900.00	Hydrosulphite of Soda — IDI (per kg)	42.00
Ammonium Bicarbonate (per 25 kg)	130.00	Hydrosulphite of Soda — BASF (per kg)	45.00
Acid Slurry Soft (per kg)	27.00	Hydrogen Peroxide (per kg)	30.00
Ammonium Chloride SPIC (per MT)	2,600.00	Hyflo Supercell (per kg)	19.50
Bleaching Powder (per 25 kg bags)	110.00	Magnesium Carbonate (per kg)	18.00
Borax Granular (per 50 kg)	650.00	Potassium Bichromate (per kg)	26.00
Caustic Soda Flakes — Mettur Chemicals (per MT)	8,600.00	Phosphoric Acid (per kg)	19.50
Caustic Soda Flakes — Andhra Sugars (per MT)	8,600.00	Phthalic Anhydride (per kg)	22.00
Nitric Acid (per kg)	45.00	Pentaerythritol (per kg)	52.00
Copper Sulphate (per 50 kg)	1000.00	Paraffin Wax (per kg)	13.50
Resylic Acid 98/99% (per kg)	87+ED	Oxalic Acid (per kg)	25.00
Meta Cresol 40/42% (per kg)	39+ED	Soda Ash — TAC (per 75 kg bags)	320.00
Para Cresol 80/85% (per kg)	67+ED	Soda Ash — TATA (per 75 kg bags)	325.00
Formic Acid (per kg)	27.00	Sodium Cyanide Indian (per kg)	55.00
Formaldehyde (per kg)	9.00	Sodium Cyanide (Degussa) (per kg)	85.00
Glycerine (per kg)	52.00	Sodium Bichromate (per kg)	18.00
		Sodium Bicarbonate (per 50 kg bags)	290.00
		Sodium Nitrate (per 50 kg bags)	450.00

Sodium Nitrite (per 50 kg bags)	750.00
Sodium Silicate (per MT)	4500.00
Sodium Sulphate (per MT)	3500.00
Sodium Sulphide Flakes (per MT)	12000.00
Sodium Bisulphite (per 50 kg)	190.00
Stearic Acid (per kg)	30.00
Trisodium Phosphate (per 50 kg)	390.00
Titanium Dioxide — Indian TTP — (per kg)	48.00
Titanium Dioxide — Indian (Rutile) (per kg)	58.00
Urea Tech (per MT)	2800.00
Zinc Oxide (per kg)	34.00
Zinc Chloride Powder (per kg)	13.00
Zinc Sulphate (per MT)	5,000.00
Di-octyl Phthalate (per kg)	42.00
Di-butyl Phthalate (per kg)	42.00
Hexamine (per kg)	34.00

### SOLVENTS

Acetone — HOCL — (per kg)	19.00
Acetone — NOCIL — (per kg)	22.00
Diacetone (per kg)	29.00
Diethylene Glycol (per kg)	48.00
Isopropyl Alcohol (per kg)	22.00
Butanol (per kg)	34.00
Benzene — SAIL — (per lit.)	17.00
Toluene — SAIL — (per lit.)	16.00
Xylene — SAIL — (per lit.)	16.00
Phenol — HOCL — (per kg)	29.00
Turpentine (per lit.)	16.50
Trichloroethylene — MCIC — (per kg)	23.50
Carbon Tetra Chloride (per kg)	16.00
Chloroform (per kg)	26.00
Methylene Chloride (per kg)	25.00
Methanol (per kg)	11.00
Methyl Ethyl Ketone (per kg)	48.00
Collosolve (per kg)	52.00
Butyl Acetate (per kg)	42.00
Ethyl Acetate (per kg)	23.00
Triethanolamine (per kg)	23.50
Sorbitol (per kg)	35.00



# MATERIALS IMPORTED

## BOMBAY

(From 22.2.88 to 29.2.88)

**ACETIC ACID:** From France: Shivalik Bimetal Controls Ltd., 60 lbs., Rs. 1,436.

**ACETONE:** From Canada: D & H Secheron Electrodes Pvt. Ltd., 496 ltrs., Rs. 16,111.

**ACRYLAMIDE:** From Japan: RSA Polymers, 3,000 kgs., Rs. 64,267.

**ALBENDAZOLE:** From China: Wockhardt Veterinary Pvt. Ltd., 300 kgs., Rs. 2,46,357.

**ALDEHYDE C-16:** From Switzerland: Naarden (India) Ltd., 100 kgs., Rs. 23,297.

**ALDEHYDE C-18:** From Switzerland: Naarden (India) Ltd., 50 kgs., Rs. 14,726.

**ALPHA ACETO GAMMA BUTYRO LACTONE:** From Japan: Indian Drugs & Pharmaceuticals Ltd., 15,000 kgs., Rs. 13,68,421.

**D-ALPHA PHENYL GLYCINE CHLORIDE HYDROCHLORIDE:** From Italy: Lyka Labs Ltd., 2,000 kgs., Rs. 6,51,167; From Netherlands: Gujarat Lyka Organics Ltd., 5,775 kgs., Rs. 18,80,244; From Switzerland: Ranbaxy Laboratories Ltd., 5,460 kgs., Rs. 18,36,942.

**ALUMINIUM OXIDE SYNTHETIC:** From Japan: Grindwell Norton Ltd., 5,000 kgs., Rs. 1,79,213.

**ANILINE OIL:** From FRG: Cibatul Ltd., 18,400 kgs., Rs. 2,43,670; Jindal Dye Intermediate P. Ltd., 11.73 mts., Rs. 1,55,339; From Saudi Arabia: Grover Overseas P. Ltd., 12,960 kgs., Rs. 1,51,437; From UK: Mihir Chemicals, 6,240 kgs., Rs. 72,914.

**ANISALDEHYDE:** From Switzerland: The Bharat Indl. Corporation, 9 kgs., Rs. 4,670.

**AROMATIC CHEMICALS:** From France: Dept. of Atomic Energy, 20 kgs., Rs. 8,827; Oriental Aromatics, 100 kgs., Rs. 28,855; 200 kgs., Rs. 24,045; 360 kgs., Rs. 70,116; From Korea: Dome Bell Investment Pvt. Ltd., 125 kgs., Rs. 19,293; From Netherlands: S. H. Kelkar & Co., Ltd., 10 kgs., Rs. 11,531; From Switzerland: International Health Care Prod., 1,520 kgs., Rs. 5,74,909; Mysorewala Sugandhi Dhcop Factory, 51 kgs., Rs. 30,195; From UK: Shah Agarbathi & Co., 292 kgs., Rs. 69,112.

**ATRAZINE TECHNICAL:** From UK: Rallis India Ltd., 19,995 kgs., Rs. 9,32,145.

**BENZYL CYANIDE:** From Denmark: FDC Pvt. Ltd., 2,000 kgs., Rs. 79,198.

**BISPHENOL A:** From Brazil: Zenith Ltd., 20 Mts., Rs. 2,82,872; From Netherlands: National Organic Chemical Ind. Ltd., 10 mts., Rs. 2,08,887.

**BUTACHLOR TECH:** From Finland: Newsprint Trading & Sales Corpn., 34,920 Lbs., Rs. 6,16,590; From USA: Herbicides (India) Ltd., 15,839.6 kgs., Rs. 6,07,523.

**BUTYL ACETATE:** From Japan: G.C. Rescroth Inds., Ltd., 240 Lts., Rs. 14,532.

**BUTYL ACRYLATE:** From FRG: BASF India Ltd., 5,940 kgs., Rs. 1,11,748.

**BUTYLATED HYDROXY ANISOLE:** From Japan: Tata Exports Ltd., 500 kgs., Rs. 90,883.

**BUTYLATED HYDROXY ANISOLE (FOOD GRADE):** From Japan: 250 kgs., Rs. 52,957.

**BUTYL LACTATE:** From UK: Ami Essence & Perfumers, 20 kgs., Rs. 6,885.

**N-BUTYL METHACRYLATE:** From Japan: Asian Paints India Ltd., 3,060 kgs., Rs. 99,321.

**CALCIUM BORATE:** From Norway: Viraj Industries, 1,500 Mts., Rs. 46,54,105.

**CALCIUM CARBIDE:** From Poland: Industrial Oxygen Co. Pvt. Ltd., 1,89,500 kgs., Rs. 10,89,871.

**CALCIUM FLUORIDE:** From Japan: Sylvania & Laxman Ltd., 400 kgs., Rs. 30,078.

**CALCIUM FLUORO CHLORO PHOSPHATE:** From UK: Moon Tin Containers Pvt. Ltd., 14,800 kgs., Rs. 7,55,936.

**CALCIUM SILICIDE:** From France: Greaves Foseco Ltd., 2,975 kgs., Rs. 60,268; From FRG: Steel Strips Ltd., 2 Mts., Rs. 33,178.

**CAPROLACTUM:** From Belgium: NRC Ltd., 166.5 Mt., Rs. 40,85,633; From Italy: The Baroda Rayon Corporation Ltd., 311.6 Mts., Rs. 76,46,146; From Netherlands: Jagatjit Cotton Textile Mills Ltd., 2,55,000 kgs., Rs. 62,57,275; From Netherlands: Modi Rubber Ltd., 3,06,000 kgs., Rs. 75,08,731.

**CARBOFURAN:** From USA: Rallis India Ltd., 9,000 kgs., Rs. 14,71,131.

**CARNAUBA WAX:** From Brazil: Everest Paint Industries, 10,000 kgs., Rs. 1,94,749.

**CAUSTIC SODA FLAKES:** From Korea: The Standard Mills Co. Ltd., 143 Mts., Rs. 6,91,548; From Netherlands: Hindustan Lever Ltd., 143 Mts., Rs. 6,91,548.

**CAUSTIC POTASH FLAKES:** From Italy: Indian Dyestuff Inds., Ltd., 119.825 Mts., Rs. 10,37,664.

**CELLULOSE ACETATE:** From USA: Hind Filters P. Ltd., 3,900 kgs., Rs. 1,27,701.



CELLULOSE ACETATE PHALATE: From FRG: Hoechst India Ltd., 400 kgs., Rs. 2,41,82.

CHLORDANE TECH.: From USA: Pest Control (India) Pvt. Ltd., 2,045.72 kgs., Rs. 1,08,12.

2-CHLORO 2,6 DIETHYL N-BUTOXYMETHYL) ACETANILIDE: From Korea: Calcem Electronics P. Ltd., 69,840 Lbs., Rs. 2,33,180; From USA: Monsanto Chem. of India Ltd., 69,840 Lbs., Rs. 12,33,180.

CINNAMIC ALDEHYDE: From Switzerland: The Bharat Indl. Corporation, 105 kgs., Rs. 21,59.

CITRIC ACID: From China: Meena Chemical Industries, 20 Mts., Rs. 3,36,266.

COCOAMINE: From UK: Dai Karkaria Ltd., 2,028 kgs., Rs. 79,234.

2 CYANOPYRAZINE : From Iran: JR Brothers, 400 kgs., Rs. 25,058.

CYCLOHEXANONE: From China: Hindustan Ciba Geigy Ltd., 4,800., Rs. 14,27,741.

CYCLOHEXYL MERCAPTAN: From Netherlands: Polyolefins Ind. Ltd., 21,000 kgs., Rs. 7,19,91.

DELTA TETRADECALACTONE: From UK: Ami Essence & Perfumers, 5 kgs., Rs. 18,563.

DESMOPHEN: From Belgium: Leo Temprow Insulation P. Ltd., 10.75 Mts., Rs. 1,29,800; Nupam Industries, 14.48 Mts., Rs. 86,912; From FRG: Tirupati Foams Pvt. Ltd., 10.750 Mts., Rs. 1,29,800.

3,4 DICHLORO ANILINE: From FRG: Bela Plastics, 5,000 kgs., Rs. 2,81,106.

2,4 DICHLORO BENZOIC ACID 99% MIN: From Japan: Tipor Chemicals, 500 kgs., Rs. 3,073.

DICUMYL PEROXIDE: From USA: Ganga Phosphorus & Chemicals Ltd., 10,000 kgs., Rs. 1,62,291.

DICYANDIAMIDE: From FRG: Orex Pharma Pvt. Ltd., 16 Mts., Rs. 3,84,586.

N-N DIETHYL ANILINE: From Japan: Colour Chem. Ltd., 1,080 kgs., Rs. 57,926; M.S. Intermediates, 4,180 kgs., Rs. 2,48,373.

DIETHYL ANILINE: From Japan: M.S. Intermediates, 4,180 kgs., Rs. 2,48,373.

DIETHYL CARBONATE: From France: Indian Drugs & Pharmaceuticals Ltd., 3,960 kgs., Rs. 1,73,576.

3,3 DIETHYL 2,4 DIOXOTETRA HYDROPYRIDINE : From Switzerland: Roche Products Ltd., 1,600 kgs., Rs. 10,95,064.

DIETHYLENE DIAMINE: From FRG: Fine Chemicals, 4,370 kgs., Rs. 1,25,264.

DIETHYL SULPHATE: From Japan: Advent Dyes and Chemicals, 15,640 kgs., Rs. 2,81,264; PDI Chemicals P. Ltd., 5,060 kgs., Rs. 93,125.

DIHYDROMYRCENOL: From France: Oriental Aromatics, 180 kgs., Rs. 19,909.

DI ISOPROPANOLAMINE: From France: National Organic Chemical Ind. Ltd., 10 Mts., Rs. 2,90,453.

DIMETHYLAMINOETHYL ACRYLATE: From USA: RSA Polymers, 181.44 kgs., Rs. 13,191.

DIMETHYL CARBONATE : From France: Ganesh Medicament Pvt. Ltd., 5,000 kgs., Rs. 1,32,249.

DIMETHYL FORMAMIDE : From Japan: Camel Knitting & Textiles Mill, 3,040 kgs., Rs. 43,160; M. J. Exports Pvt. Ltd., 3,230 kgs., Rs. 45,858; From Iran: Paras Trading Co., 4,750 kgs., Rs. 53,037; From Japan: Tata Exports Ltd., 5,890 kgs., Rs. 83,623.

Sajjan 623; The Anup Eng. Ltd., Rs. kgs., Rs. 43,160.

DIMETHYL SULPHOCHLORIDE: From Hungary: Precision D Chemicals Equipments, 7,980 kgs., Rs. 1,879; From UAE: Balkrishna F Jo-Mills Ltd., 7,430 kgs., Rs. 1,879; From USA: German Reindies Ltd., 5,000 kgs., Rs. 1,125.3.

DINITRO ORTHO TOLUAMIDE: From France: Tata Exports Ltd., 2,000 kgs., Rs. 1,68,780.

DI OCTYL PHTHALATE: From FRG: Arjun Impex, 15,600 kgs., Rs. 1,62,030; From Italy: Electronic Circuits Ltd., 15,600 kgs., Rs. 1,62,030.

DI OCTYL TIN OXIDE: From Japan: Gandhi Parekh Investment Corp. Ltd., 1,000 kgs., Rs. 1,09,829.

DIPHENYL OXIDE : TECH: From USA: Pradhan Perfumers, 2,800.98 kgs., Rs. 61,095; Sharvani Pharms. Ltd., 1,077.3 kgs., Rs. 23,498; From FRG: Shika International, 5,000 kgs., Rs. 97,375.

DIVINYL BENZENE: From USA: Henkel Chemicals Ltd., 11,031.37 kg., Rs. 8,07,778.

EPOXY RESIN: From Japan: Usha Electronics India Pvt. Ltd., 760 kgs., Rs. 68,344.

ETHYL CAPRYLATE: From Switzerland: The Bharat Indl. Corporation, 15 kgs., Rs. 6,190.

ETHYL CELLULOSE: From USA: Ajay Electrical Inds. Ltd., 498.96 kgs., Rs. 76,549; M.S. Patel & Co., 567 kgs., Rs. 75,456.

N ETHYL CYCLOHEXYLAMINE: From FRG: Umpatel Rubbers Ltd., 170 kgs., Rs. 11,774.

ETHYLENE GLYCOL MONOETHER : From FRG: Dura Chemical Corpn. P. Ltd., 15,288 kgs., Rs. 2,16,497.



ETHYL ISO BUTYLATE: From Switzerland: The Bharat Indl. Corp., 15 kgs., Rs. 6,387.

ETHYL LACTATE: From UK: Ami Essence & Perfumers, 20 kgs., Rs. 4,444.

ETHYL VANILLIN: From France: Rallis India Ltd., 100 kgs., Rs. 27,265; From Switzerland: The Bharat Indl. Corporation, 1,006 kgs., Rs. 2,86,686.

EUGENOL: From Singapore: The Tata Oil Mills Co. Ltd., 2,000 kgs., Rs. 1,55,799.

FERRIC OXIDE: From FRG: Cosmo Ferrites Ltd., 20,000 kgs., Rs. 5,80,953.

FORMIC ACID 85%: From FRG: Quality Carpet Traders, 50,995 kgs., Rs. 3,70,103.

FURAZOLIDONE: From Hungary: Seva Enterprises, 16,500 kgs., Rs. 15,79,365.

FURFURYL ALCOHOL: From Belgium: Nirval Keramchemie Pvt. Ltd., 1,680 kgs., Rs. 37,080.

GAMMA DODECALACTONE: From UK: Ami Essence & Perfumers, 5 kgs., Rs. 8,032.

GAMMA FERRIC OXIDE: From USA: Garware Plastics & Polyester Ltd., 9,000 kgs., Rs. 6,45,007.

GERANIO NITRILE: From France: Oriental Aromatics, 360 kgs., Rs. 1,38,501.

GLYCEROL: From Malaysia: Suparna Chem. Pvt. Ltd., 15,000 kgs., Rs. 2,62,911.

GLYOXAL: From FRG: Unique Pharm. Labs., 7.7 Mts., Rs. 79,177; From Japan: M.K. Marketing, 8 Mts., Rs. 87,378.

GUM ARABIC: From Saudi Arabia: Grover Overseas P. Ltd., 50 kgs., Rs. 8,12,987; From Singapore: Weston Electronics Ltd., 50 kgs., Rs. 8,12,987.

GUM BENZOIN: From Indonesia: Maxim Corporation, 7,500 kgs., Rs. 60,450; R. K. Traders, 2,886 kgs., Rs. 21,807; From

Singapore: Mehta & Sons, 3,926 kgs., Rs. 45,096.

GUM COPAL: From Indonesia: Universal Polymers, 2,482 kgs., Rs. 18,534.

GUM DAMAB: From Indonesia: Mehta & Sons, 7,661 kgs., Rs. 20,851; From Singapore: Gama & Co., 10,500 kgs., Rs. 29,621.

GUM ROSIN: From Hong Kong: L.B. Publishers & Distributors, 49.95 Mts., Rs. 3,07,503.

GUM ROSIN N GRADE: From China: Bhagvati Enterprises, 17,550 kgs., Rs. 1,13,923.

GUM ROSIN WW GRADE: From China: U.K. Paint Industries, 49.91 Mts., Rs. 3,33,984.

HELIOTROPIN: From Switzerland: The Bharat Indl. Corp., 9 kgs., Rs. 7,528.

HEMICELLULOSE: From FRG: Hoechst India Ltd., 1,200 kgs., Rs. 7,09,070.

HEXAMINE: From China: F.D. C. Pvt. Ltd., 4 Mts., Rs. 39,729.

HEXANOL: From Switzerland: Mysorewala Sugandhit Dhoop Fac. 25 kgs., Rs. 34,976.

HOMOVERATRYLAMINE: From Switzerland: Roche Products Ltd., 400 kgs., Rs. 3,50,260.

HYDROFLUORIC ACID SOL: From Australia: The Raymond Woollen Mills Ltd., 600 Lbs., Rs. 14,032.

HYDROXYETHYL CELLULOSE: From Netherlands: PDI Chemicals P. Ltd., 1,000 kgs., Rs. 51,933.

IODINE CRUDE: From Belgium: Usan Laboratories Pvt. Ltd., 1,700 kgs., Rs. 3,99,494; From Japan: Eskay Fine Chemicals, 500 kgs., Rs. 1,28,209; From Taiwan: Able Industries 500 kgs., Rs. 1,14,577.

IONOMER RESIN: From USA: Essel Packaging Ltd., 1,134 kgs., Rs. 32,458.

ISOBORNYL ACETATE: From FRG: Dujodwala Udyog Ltd., 9.6 Mts., Rs. 1,45,080.

ISO CAMPHYL CYCLOHEXANOL: From Switzerland: Naarden India Ltd., 50 kgs., Rs. 11,868.

ISO HEXENYL TETRA HYDRO BENZALDEHYDE: From France: Oriental Aromatics, 200 kgs., Rs. 36,068.

ISO OCTYL THIO GLYCOLATE: From France: Gandhi Parekh Investment Corp. Ltd., 14,820 kgs., Rs. 6,59,822.

ISOPHTHALIC ACID: From Japan: Resins & Plastics Ltd., 3,000 kgs., Rs. 42,844.

ISOPHYTOL: From Italy: Yusufi Optical Ind. 5100 kgs., Rs. 10,07,704.

ITACONIC ACID: From USA: PDI Chemicals Pvt. Ltd., 500 kgs., Rs. 24,344.

LACTOSE: From Netherlands: Seventilal & Co., 18,000 kgs Rs. 1,86,841.

LAURYL ALCOHOL ETHOXYLATE: From FRG: Galaxy Chemicals 15,840 kgs., Rs. 2,96,143.

LAURYL ALCOHOL ETHOXYLATE: From FRG: Galaxy Chemicals, 15,840 kgs., Rs. 2,96,143.

LIGNIN ALDEHYDE: From UK: Mihir Chemicals 219 kgs., Rs. 20,756. From USA: Bharat Heavy Elect. Ltd., 219 kgs., Rs. 20,756.

LILIAL: From Switzerland: Naarden India Ltd., 50 kgs., Rs. 14,945.

LITHIUM CARBONATE: From Netherlands: Sandoz (India) Ltd., 1,360.77 kgs., Rs. 62,904. From USA: Five Star Engineers, 2,200 lbs., Rs. 46,129.

LYRAL: From Netherlands: Hindustan Lever Ltd., 1,200 kgs., Rs. 3,63,351.

L-LYSINE MONO HCL: From Japan: Avet Chemicals Pvt. Ltd., 1,000 kgs., Rs. 38,950; From Japan: Mangalaya Trading & In-



stment., 2,000 kgs., Rs. 1,18,-  
7; From Japan: Salvi Chemi-  
ls Inds., 1,500 kgs., Rs. 56,-  
7; Sarabhai International Ltd.,  
000 kgs., Rs. 59,723.

DL MALIC ACID: From FRG:  
rasim Indus. Ltd., 75.35 Mts.,  
s. 5,90,737; From Japan: Sat-  
am Rubber Inds. 75.35 Mts.,  
s. 5,90,737.

MALONITRIDE HOMOVERA-  
RYLAMINE: From Switzerland:  
oche Products Ltd., 100 kgs.,  
Rs. 24,659.

MANGANESE DIOXIDE: From  
USA: Central Electronics Ltd.,  
118 Mts., Rs. 5,98,618.

PARAQUAT DICHLORIDE :  
From Taiwan: Herbicides (India)  
Ltd., 5,000 kgs., Rs. 2,53,174.

METHACRYLIC ACID: From  
Japan: PDI Chemicals P. Ltd.,  
950 kgs., Rs. 27,974.

METHANOL: From Malaysia:  
The State Trading Corpn., 2023.  
088 Mts., Rs. 49,40,485.

DL METHIONINE: From USA:  
S. K. Chemical Inds. 3,000  
kgs., Rs. 1,16,849.

METHYL CELLULOSE: From  
UK: E. Merck India Ltd., 500 kgs.,  
Rs. 42,030.

4-METHYL 1 (3 CHLORO  
PROPYL) PIPERAZINE HCL :  
From UK: May & Baker (I) Ltd.,  
330 kgs., Rs. 1,52,220.

N-METHYL PIPERAZINE: From  
Sweden: Industrial Trading Co.  
1,190 kgs., Rs. 1,82,740.

N-METHYL TAURINE 55 SO-  
DIUM SALT: From USA: Azofon  
Ltd., 816.45 kgs., Rs. 30,638.

N-METHYL PIPERAZINE: From  
FRG: Burroughs Wellcome India  
Ltd., 3,400 kgs., Rs. 5,45,655.

MICROCRYSTALLINE WAX :  
From FRG: Samir Dyechem: 49-  
95 kgs., Rs. 48,638; Enkay India  
Rubber Co. Pvt. Ltd., 2,688 kgs.,  
Rs. 55,838; From Spain: United  
Chem. & Soap Mills 991 kgs.,  
Rs. 14,500.

MOLYBDENUM DISULPHIDE: 15,000 kgs., Rs. 99,322; Sajjan  
Impex Pvt. Ltd., 45,000 kgs., Rs.  
2,97,966.

MONO ETHYLENE GLYCOL: 15,000 kgs., Rs. 99,322; Sajjan  
Impex Pvt. Ltd., 45,000 kgs., Rs.  
2,97,966.

MORPHOLINE: From USA:  
Polyolefins Inds. Ltd., 15.023  
Mts., Rs. 3,53,036; The Univer-  
sal Traffic Co., 15,023 kgs., Rs.  
3,58,887.

NAPHTHALENE CRUDE: From  
Australia: The Atul Products Ltd.,  
311.4 Mts., Rs. 16,174,194;  
From Canada: Dyes & Dispers-  
ing Agent Pvt. Ltd., 8,440 Mts.,  
Rs. 55,885; May Chem. India  
Pvt. Ltd., 15,000 kgs., Rs. 99,-  
322; Mayoga Chem. Pvt. Ltd.,

15,000 kgs., Rs. 99,322; Sajjan  
Impex Pvt. Ltd., 45,000 kgs., Rs.  
2,97,966.

NAPHTHAQUINONE DICHLOR-  
IDE: From Japan: Auromic Che-  
nicals, 500 kgs., Rs. 73,617.

NITRIC ACID: From USA: Jo-  
hnson and Johnson Ltd., 616 Lbs.  
Rs. 11,045.

4 NITRO 2 AMINO PHENOL:  
From Japan: Indian Dyestuff  
Inds. Ltd., 4,300 kgs., Rs. 4,94,-  
636.

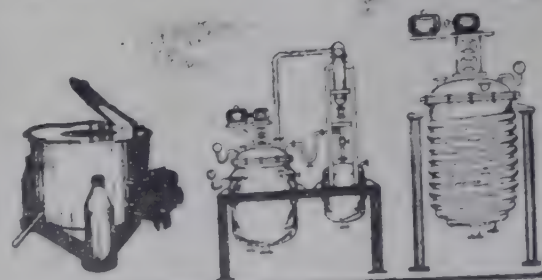
5 NITRO 2 FURFURALDEHY-  
DE DIACETATE: From Hungary:  
Kemwell Pvt. Ltd., 5,000 kgs.,  
Rs. 2,16,820

NORMAL BUTANOL: From  
UK: Goodlass Nerolac Paints  
Ltd., 13,260 kgs., Rs. 1,48,917.

NOVALDIAMINE: From FRG:  
Bayer (India) Ltd., 1,980 kgs.,  
Rs. 6,33,222; IPCA Laboratories,  
1980 kgs., Rs. 6,25,317.

## BILLY creates an impact! In the field of chemical plant and process industry.

Precision and accuracy!  
That's the underlying  
philosophy of BILLY. People  
who have the latest know-  
how, expertise and  
capability in the field of  
chemical plant and process  
machinery.



### Our Manufacturing Range :

- \* Centrifuges
- \* Ball Mills
- \* Filter Presses
- \* Multi Mills
- \* Rotary Dryers
- \* Evaporators
- \* Crystallizers
- \* Tray Dryers
- \* Drum Dryers
- \* Reaction Vessels
- \* Heat Exchangers
- \* Rotary Kilns
- \* Distillation Units
- \* Mixers, etc.

Available under the IDBI  
Deferred Payment Scheme.

**BILLY  
ENGINEERING  
ENTERPRISES**

Designers, Engineers & Manufacturers  
761, Thiruvottiur High Road,  
Madras-600 081. Phone : 554619



**OCTADECYCLAMINE** : From Netherlands: Stovec Screens India Ltd., 160 kgs., Rs. 5,713.

**OCTOIC ACID**: From UK: Cawasji Behramji & Co., 5,101 Mts., Rs. 74,134; Halol Leather Cloth Mfg. Co. Ltd., 5,191 Mts., Rs. 74,134.

**OLEAMIDE**: From UK: Indian Petrochemicals Corpn. Ltd., 16,000 kgs., Rs. 4,51,678.

**OLEYL ALCOHOL**: From FRG: Kores (India) Ltd., 8,500 kgs., Rs. 3,000,173.; Papega (Insulation/packaging) Ltd., 5,100 kgs., Rs. 180,104.

**OLEYL CETYL ALCOHOL**: From FRG: Dai Ichi Karkaria Ltd., 3,060 kgs., Rs. 77,292.

**ORTHO CHLORO PARA NITRO ANILINE**: From Japan: Jaysynth Dychem P. Ltd., 3,000 kgs., Rs. 2,49,245.

**N-OXYDIETHYLENE BENZOTHAZOLE**: From U.K.: Good Year India Ltd., 3,000 kgs., Rs. 1,47,009.

**PARACRESOL**: From USA: Vijay Chemicals: 14,901 kgs., Rs. 4,90,474.

**PARACRESOL PURE 5000 99%** Purity: From UK: 16 Mts., Rs. 5,46,335.05.

**PARAFORMALDEHYDE**: From Barcelona: Caprihans India Ltd., 18 Mts., Rs. 33,480. From Spain: Flenkel Chemicals India Ltd., 13,675 Mts., Rs. 76,345.

**PARAFORMALDEHYDE 96%** : From Spain: Indmag Pvt. Ltd., 5,000 kgs., Rs. 29,212; Indmag Pvt. Ltd., 13,000 kgs., Rs. 70,888.

**PARA NITRO CHLORO BENZENE**: From China: Prekoll 25 Mts., Rs. 2,70,444. From USA: Dinesh Chemicals P. Ltd., 42,456 kgs., Rs. 6,25,631.

**PARA OCTYL PHENOL**: From Japan: Atsuan Chemical Corpn., 2,000 kgs., Rs. 37,651.

**PARA TERTIARY BUTYL PHE-**

**NOL**: From FRG: Southern Sea Foods P. Ltd., 4 Mts., Rs. 62,320; From Japan: Partap Rajasthan Copper Fills & Co. 8,400 kgs., Rs. 1,41,777.

**PERCHLOROETHYLENE**: From Belgium: A.S. Corporation 20,460 kgs., Rs. 1,40,786; From Finland: Business India, 10,044 Mts., Rs. 70,418.

**PERCHLOROETHYLENE**: From FRG: Anshul Chemicals Pvt. Ltd., 18,760 kgs., Rs. 1,28,331; From Hong Kong: Overseas Carpets Ltd., 10,044 Mts., Rs. 70,418. From Japan: Hyderabad Allwyn Ltd., 10,044 Mts., Rs. 70,418; From U.K.: Chemicals International Pvt. Ltd., 10,044 Mts., Rs. 70,418.

**PHENOL**: From Japan: Usha International, 4 Mts., Rs. 54,530.

**PIVALOYL CHLORIDE**: From France: Lawande Pharma Pvt. Ltd., 5,040 kgs., Rs. 3,55,688. From USA: Indmag Pvt. Ltd., 2,014 kgs., Rs. 1,13,681.

**POLYCARBONATE MOULDING POWDER**: From FRG: Polyset Plastics P. Ltd., 13,860 Mts., Rs. 4,93,056.98.; From Germany: Agromach Spare Corpn., 900 kgs., Rs. 53,899.; Power Control & APP Bom. Pvt. Ltd., 6,300 kgs., Rs. 2,37,204.; From Korea: United Drugs: 900 kgs., Rs. 53,899.

**POLYETHYLENE GLYCOL** : From FRG: IVP Ltd., 2,000 kgs., Rs. 81,480.

**POLYVINYL ALCOHOL**: From FRG: Central Electronics Pvt. Ltd., 4 Mts., Rs. 3,21,180.; Mafatlal Dyes & Chemicals 1,000 kgs., Rs. 48,644; Polydyne Corpn., 32 Mts., Rs. 7,06,289.; From Japan: Indian Petrochemicals Corpn. Ltd., 11 Mts., Rs. 3,69,037. Sterling Hides and Skin Inds. 3,760 Mts., Rs. 74,101. From USA: Mafatlal Fine Spg & Mfrs.

Co. Ltd., 250 kgs., Rs. 52,582.; Mafatlal Inds. Ltd., 9,000 kgs., Rs. 2,10,328.

**POLYVINYL PYRROLIDONE** : From FRG: Mafatlal Inds. Ltd., 2,520 kgs., Rs. 3,24,420.

**POTASSIUM HYDROXIDE** : From USSR: Oil & Natural Gas Commission 3,000 kgs., Rs. 29,016.

**POTASSIUM SILICATE** : From FRG: JCT Electronics Ltd., 274 kgs., Rs. 2,358.

**PROPIONIC ACID**: From Japan: Calpro., 15,200 kgs., Rs. 1,16,878.

**PROPYLENE GLYCOL TECH**: From Brazil: American Dry Fruit Stores., 34,400 kgs., Rs. 3,56,269.

**PROPYLENE GLYCOL** : From Japan: Mangalya Inds. & Inv. Pvt. Ltd., 10,710 kgs., Rs. 1,15,134.; From USA: Fibre Bond Inds., 17.2 Mts., Rs. 1,80,883.

**PYRIDINE**: From Denmark: Euresian., 800 kgs., Rs. 51,932.

**RED OXIDE**: From UAE: Sitco Paints Chemicals Inds., 350 Mts., Rs. 5,40,665.

**SODIUM ALGINATE (Dental Grade)** : From Norway: Dental Products of India Ltd., 500 kgs., Rs. 56,802.

**SODIUM ALLYL SULPHONATE**: From UK: National Electroplaters Ltd., 4,900 kgs., Rs. 67,332.

**SODIUM BORATE**: From Poland: Farmson Pharmaceutical 100 Mts., Rs. 4,51,741.

**SODIUM CARBONATE**: From USA: Kirloskar Cummins Ltd., 1,350 Lbs. Rs. 22,055.

**SODIUM CHLORITE 80%** : From Spain: Agarwal Chemicals. 1,995 kgs., Rs. 62,164; Fluor & Food Ltd., 1,995 kgs., Rs. 62,164.

**SODIUM CHLORITE** : From Spain: Fluor And Food Ltd., 5005 kgs., Rs. 1,26,713.



For Your Requirements Of :

Di Octyl Phthalate (D.O.P.)

Di Octyl Maleate (D.O.M)

Di Butyl Phthalate (D.B.P.)

Di Octyl Adipate (D.O.A.)

Di Butyl Maleate (D. B. M.)

Butyl Stearate

Please Contact Manufacturers :

## **SAVITA ORGANIC CHEMICAL INDUSTRIES**

1218, Dalamal Tower, Plot No. 211, Nariman Point, Bombay-400 021.

Phone : 230006, 231192, 233554, 233562

# **RAPID FAST COLOURS and DEVELOPING FAST SALTS**

For Most Competitive Prices Contact Manufacturer:

**star dyechem industries**

135, Todi Ind. Estate, N. M. Joshi Marg,  
BOMBAY-400 011.

Phone : 392013 & 899101

(WANTED STATEWISE DISTRIBUTORS)

Ask For S. N. Quality Products :

**WE  
SINCE**



**SERVE  
1960**

**M/s. SARABHAI NEMCHAND**

55, Kazi Syed Street, Mandvi, BOMBAY-400 003.

GUM ARABIC (Pharma Grade)

GUAR GUM (Pharma Grade)

GUM TRAGACANTH (B.P.C. Standard)

GUM ACCACIA (Powder & Crystals)

GUM KORDAFON (For Offset Printing)

PAPER GUM

PRINTING GUM

ALGINEX (S.N.) (Substitute for Sodium Alginate)

Phone: Office: 325191, 349288, 344472

Gram : PANCHASARA

Resi.: 295351, 8282148, 8116949, 8111567, 8114445

WE HAVE NO BRANCHES



CATALYSTS AVAILABLE Manufactured by Latest Technology

AMMONIUM IODIDE  
 BARIUM IODIDE  
 COBALT IODIDE  
 CUPROUS IODIDE  
 LEAD IODIDE  
 MERCURIC IODIDE  
 SODIUM IODIDE  
 ZINC IODIDE  
 POTASSIUM IODIDE & IODATE



L C TRADERS

403, "YOGESHWAR"

135/139, Kazi Syed Street, Bombay-3.

Tele.: Offi.: 326542/331100

Resi.: 5135908/5112967

Grams: "SULPHATES" — Chinchbunder

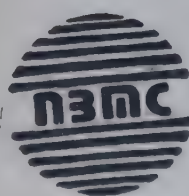
Consumers & Exporters  
 CONTACT FOR YOUR REQUIREMENTS OF

P.T.S. Acid

P.T.S. Chloride

Para Toluene Sulphonamide

Sodium Saccharine Soluble



NAV BHARAT  
 MINERALS & CHEMICALS

8, Harash Chambers, 313/319, Samuel Street, Bombay-400 003.  
 Phones: 320510 • 338457 • 343429

Z I N C O X I D E

White Seal/Rubber Grade/Confirming to I. P.

And All Other Varieties

VORA CHEMI TRADE  
 PVT. LTD.

265, Samuel Street, Bombay-400 003.  
 Phones : 333762/63/64/325265/345377



# CAXTON

- Mono-Ammonium Phosphate
- Di-Ammonium Phosphate
- Mono-Sodium Phosphate - Crystals
- Mono-Sodium Phosphate - Anhydrous
- Sodium Acid Pyro Phosphate
- Di-Sodium Phosphate - Crystals
- Di-Sodium Phosphate - Anhydrous
- Tetra Sodium Pyro Phosphate
- Tri Sodium Phosphate - Anhydrous
- Mono Calcium Phosphate
- Di-Calcium Phosphate -  $2H_2O$ /Anhydrous
- Tri-Calcium Phosphate
- Mono Potassium Phosphate
- Di-Potassium Phosphate
- Tetra Potassium Pyro - Phosphate
- Sodium Acetate - Crystals
- Sodium Acetate - Anhydrous
- Tri Magnesium Phosphate
- Zinc Phosphate
- Aluminium Phosphate

Available in All Grades  
TECH - C.P. - Pharma grade - A.R./L.R.

Manufacturers

## CAXTON CHEMICAL INDUSTRIES

**Regd & Reply Office**

CORNELIAN 104, AUGUST KRANTI MARG  
5TH FLOOR, FLAT NO. 3, BOMBAY-400 036  
PHONE: 38 05 43

**Admn. Office**

70, MASJID BUNDER ROAD, HANSRAJ KARAMSHI  
BLDG, ROOM NO. 32, 3RD FLOOR, BOMBAY-400 003  
PHONES: 855 05 25, 855 34 91, 855 26 72  
GRAM: CAXCHEMIND, BOMBAY-400 036

**FACTORY.**

Village-Waliv VASAI (EAST)  
Dist: Thane (MAHARASHTRA) Phone: 260





**Sunshine bright!**



The glow of yellow...  
it puts everything  
else in the shade.



# Procion Dyes

Brighter shades. Better shades.

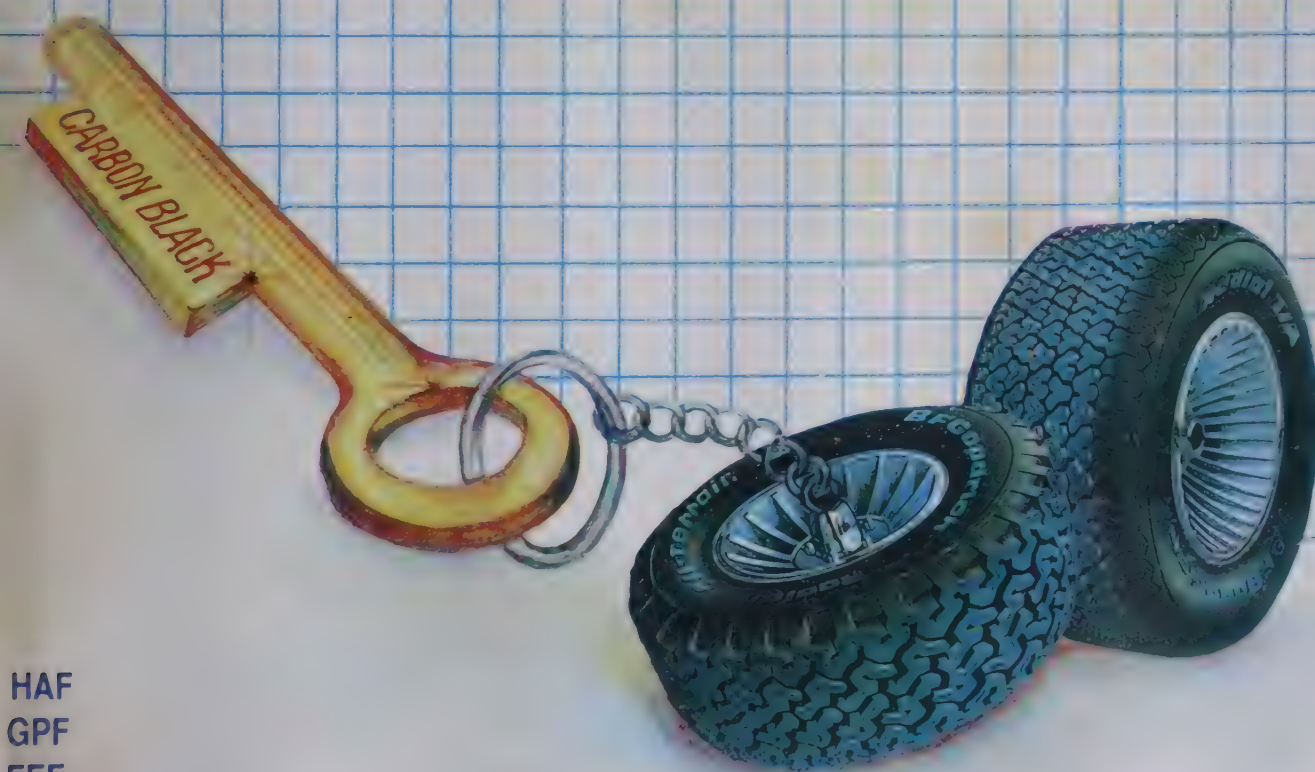


Atic Industries Limited  
Post Atul, 396 020, Dist. Valsad, Gujarat.



# Chemical Weekly

THE KEY INGREDIENT  
FOR BETTER MOVEMENT !  
**CARBON BLACK**



HAF  
GPF  
FEF  
SRF

MARKETED BY  
AUTHORISED CONSIGNMENTS AGENTS :

**AGDISHPRASAD VIJAYKUMAR**

MAKER CHAMBERS V, NARIMAN POINT, BOMBAY 400 021.

PHONE : 204 44 76 \* 204 82 89 \* TELEX : 011- 2222 JVSC IN \* GRAM: BHIMRA IKA



Indian  
Rayon

**HI-TECH CARBON**





# Better care for greater beauty

## **PIDICRYL<sup>®</sup>** ACRYLIC EMULSIONS FOR LEATHER FINISHING

### SYNTHETIC TANNING AGENT

#### **ACRYTAN 650**

A synthetic tanning agent for retanning chrome leather.

#### **PIDICRYL LB-1911**

An anionic acrylic copolymer emulsion binder for impregnation and base coat.

#### **PIDICRYL LI-77**

An anionic acrylic copolymer emulsion binder for middle to top coat finishing

#### **PIDICRYL 89-A/89-B**

Soft acrylic leather finishing binders mainly developed for soft supple nappa clothing leather

#### **PIDICRYL LGM-1111/LSF**

Very soft acrylic leather finishing binders mainly developed for soft supple nappa clothing leather.

### PENETRATING AGENT

#### **PENETRATOR 1012**

For impregnation of corrected grain side leather together with Pidicryl LB 1911.

### PROTEIN BINDER

#### **PIDIGLAZE KU**

A non-thermoplastic cream-coloured liquid suitable as binding and lustring agent.

### DEGREASING/ WETTING AGENTS

#### **PIDINONS**

Non-ionic surface active agents for leather processing.



## **PDI Chemicals Pvt. Ltd.**

Wetting Division, Ramkrishna Mandir Road, Off. M. Vengal Road,  
P.O. Box No. 17401, Rainbow-400 059, Phone: 3307550



**If You Are Determined**

**THAT YOUR PRODUCT SHOULD BE THE BEST  
AND SAFE IN THE MARKET**

**Then You Will Hit It Off With Our**

**SILICA GEL**

**Indicating and Non-Indicating**

**Activated Alumina Balls**

**FOR**

**PHARMACEUTICALS & INDUSTRIES**

**WE WILL MEET YOUR SPECIFICATIONS**

**For Removal of Moisture & Control of Humidity from**

**AIR & GAS**

**Ensure Your Product By Using**

**SILICA GEL BAGS**

**(Indicating --- Non-Indicating)**

**Please Contact:**

***Industrial Organics***

**100, Dadasaheb Phalke Road, (C.Rly), BOMBAY - 400 014.**

**Phones: Office: 448051/448661**

**Residence: 4221658**

**Associates**

**DRIER CHEMICALS**



**Formic acid 85% (BASF)**

**Formaldehyde 37%**

**Methanol -- RCF**

Tanker Load & Drums

**Acetone** (HOC) (Tanker Load & Drums)

**T.B. Linear Alkyl Benzene (LAB)**

**Para Tertiary Butyl Phenol (PTBP)** (Japan)

Melamine

N-Butanol

Isobutanol

Isopropanol (IPA)

Phenol

Methylene Chloride

Aniline Oil

Nitro Benzene

Cellosolve (Belgium)

Propylene Glycol

Thionyl Chloride (Imported)

Octanol (2-Ethyl Hexanol)

D.O.P.

PVC Resin Suspension Grade

M.I.B.K.

Ethylene Vinyl Acetate (EVA)

Sulphamethaxole

Thiamine HCl (for A.U. only) (Vitamin B1)

Cloxacillin Sodium (for A.U. only)

Hydrazine Hydrate

Morpholine

-- W.Germany

-- Brazil/Yugoslavia

-- Holland

-- Dow, American

-- Japan

-- Takeda, Japan

-- Singapore

-- Imported

CONTACT:

**ORIENTAL INDUSTRIES**

229/231, Samuel Street, 11th Floor, Bombay - 400 003

Phones: Off: 339927/346398/343923

Resi: 4376132/4372052/4377159/537243/541323

Gram: ORIENDUS

Telex: 011-2566 OM IN



8 SEP 1988

*Available Regularly*

C. P. T. R. I., MYSORE

**DIBUTYL MALEATE**

**DIOCTYL MALEATE**

**OCTYL STEARATE** (ODOURLESS)

**BUTYL STEARATE**

**BUTYL BENZOATE**

**COCODIETHANOLAMIDE**

**SORBITAN MONO OLEATE**

(DECOLOURISED) S.M.L. & S.M.S. ETC.

**FATTY ACID ESTERS**

**At Most Competitive Rates**

Contact Manufacturers:



**FINE ORGANICS**

15/2, NEELKANTH MARKET, M.G. ROAD, GHATKOPAR (E),

BOMBAY 400 077

PHONES: 5135356, 5135471, 5135687



Please Contact for Prompt Supplies Of:

# Anhydrous Ammonia Gas

In 5/7/9 Tons Capacity Road Tankers and

In 60/50/40 Kgs. Capacity Cylinders.

Also Available **LIQUOR AMMONIA**

In Carboys and Drums

## *Surat Ammonia Supply Company*

B.N. Chambers, 2nd Floor, R.C. Dutt Road, Baroda 390 005.

Phones: 326503, 323827, 321897 & 320676 \* Gram: SASCO \* Telex: 0175-497 SASC-IN

Vapi Office: Shed No. 19, C-1, B. Type, Vapi Industrial Estate, G.I.D.C., Vapi-396 195. Phone: 685.

Ankleshwar Office: J-3435, G.I.D.C. Estate, Ankleshwar-393 002, Gujarat State. Phone: 2449.

## **BOMBAY AMMONIA & CHEMICAL CO.,**

204, Wing-B, Neelam Centre, 2nd Floor, Hind Cycle Road, Behind Glaxo, Worli, Bombay 400 025.  
Phones: 4948652/4948659/4946686

Available at Most Competitive Rate

ETHYLENE CHLORO HYDRINE 98%

THIOGLYCOLLIC ACID

LITHIUM CARBONATE

LITHIUM HYDROXIDE

BUTYLATED HYDROXY ANISOLE

CHLORO HEXIDINE GLUCONATE

SOLUTION

SORBIC ACID

M.E.G. Distilled

D.E.G. Distilled

ISO PROPYL MYRISTATE

TERT. BUTYL ALCOHOL

BUTYL CELLOSOLVE

TRI ETHYLENE GLYCOL

SODIUM DIETHYL DITHIO CARBOMATE

DIETHYL AMINE

TRI ETHYL AMINE

ISO PROPYL AMINE 99%

HEXYLENE GLYCOL

MAGNESIUM OXIDE

Please Contact:

## **M/s. HARIBHAI JEEBHAI & CO.**

22, Shamaldas Gandhi Marg, Princess Street, Bombay 400 002.

Tel: 312116, 254950, 253945.

Telex: C/o. 011-3185



NOW AVAILABLE:

**96% A.D. DODECYL BENZENE SULPHONATE**  
(HARD ACID SLURRY)**LINEAR ALKYL BENZENE SULPHONATE**  
(SOFT ACID SLURRY)**SULPHONATED WITH SULPHUR TRI-OXIDE**

MANUFACTURERS:

***Arochem Silvassa Pvt. Ltd.,***Industrial Estate, Silvassa-396 230 -- Via Vapi,  
Dadra & Nagar Haveli.

Phone: 289, 291      Gram: AROCHEM SILVASSA

Telex: 0185 201 ARCM IN

- BOMBAY** : Scent House, Station Road, Goregaon (West), Bombay-400 062.  
Phone: 6722280, Gram: AROSILVASSA, Telex: 011-78077 FAIS IN
- KANPUR** : Chemdet Enterprises, Shop 67, 75/232, Sabji Mandi, Kanpur.  
Gram: SCENTOUS, Telephone: 64551
- MADRAS** : Syndet Enterprises, 90, Govindappa Naick Street, Madras-600 001.  
Gram: SCENTOUS, Telephone: 35532
- DELHI** : B. Shantilal & Co., 1025/5, First Floor, Gali Teliyan, Tilak Bazar, Delhi-110 006.  
Gram: INDOSIL, Telephone: 291 3973/0649

AVAILABLE REGULARLY

***SPRAY DRIED 40%***  
***A.D. ANIONIC DETERGENT***  
***POWDER NEUTRAL-pH: 7-7.5*****In Snow White Colour & Free Flowing**  
**Bulk Density below 0.3**

Manufacturers

***Silvassa Syndet Private Limited***Amli Industrial Estate,  
SILVASSA - 396 230 -- Via Vapi,  
Dadra & Nagar Haveli  
(Phone: 280)



DIRECT IMPORTERS & STOCKISTS OF:  
**POLY VINYL ALCOHOL**

HOT GRADE -- POLYSIZER 173/BF--17

COLD GRADE -- GOHSENOL GH--17/BP-20/BP--17/BP--24/GL--05/BP--05

Acrylamide--Japan  
 Acrylic Acid--Japan  
 Hydroxy Ethyl Cellulose  
 Natrosol<sup>250</sup> LR/GR/HBR Hercules Make  
 2 Ethyl Hexyl Acrylate  
 Butyl Acrylate  
 P.T.B.P.

Titanium Dioxide  
 Hydrogen Peroxide 50%  
 Emulsifier Polyethylene  
 Wax  
 Poly Vinyl Acetate  
 Emulsion  
 M.E.K.

Please Contact:



## HEAVY CHEMICALS CORPORATION

18/20, V.V. Chandan Street, Kachwala Building, 2nd Floor, Off Masjid Bunder Road,  
 Bombay - 400 003.

Phones: 327973/348148

Please Contact for Prompt Supplies Of:

## Anhydrous Ammonia Gas

In 5/7/9 Tons Capacity Road Tankers and

In 60/50/40 Kgs. Capacity Cylinders.

Also Available **LIQUOR AMMONIA**

In Carboys and Drums

## Surat Ammonia Supply Company

B.N. Chambers, 2nd Floor, R.C. Dutt Road, Baroda 390 005.

Phones: 326503, 323827, 321897 & 320676 \* Gram: SASCO \* Telex: 0175-497 SASC-IN

Vapi Office: Shed No. 19, C-1, B. Type, Vapi Industrial Estate, G.I.D.C., Vapi-396 195. Phone: 685.

Ankleshwar Office: J-3435, G.I.D.C. Estate, Ankleshwar-393 002, Gujarat State. Phone: 2449.

## BOMBAY AMMONIA & CHEMICAL CO.,

204, Wing-B. Neelam Centre, 2nd Floor, Hind Cycle Road, Behind Glaxo, Worli, Bombay 400 025.  
 Phones: 4948652/4948659/4946686



# WHERE WOULD YOU GO IF YOU NEEDED QUALITY CHEMICALS?

AUTHORISED DISTRIBUTORS OF R.C.F.:

**METHANOL**

**SODIUM NITRATE**

**SODIUM NITRITE**

**AMMONIUM-BI-CARBONATE**

AUTHORISED DISTRIBUTORS OF GSFC:

**METHYL ETHYL KETONE OXIME (MEK OXIME)**

DEALER OF HINDUSTAN ORGANIC CHEMICALS:

**ACETONE**

**PHENOL**

DEALER OF CENTURY RAYON:

**ANHYDROUS SODIUM SULPHATE**

DEALER OF STANDARD ALKALI:

**CAUSTIC SODA LYE**

**CAUSTIC SODA FLAKES**

AUTHORISED STOCKIST OF T.T.P. LTD.:

**TITANIUM DIOXIDE**



**POPAWALA & CO.**

1502, MAKER CHAMBERS V, 221, NARIMAN POINT, BOMBAY-400 021 INDIA  
CALL: 23 01 56 • 24 45 93 • 287 11 15 TELEX: 011-4164 POP IN



**CHEMICALS**

**FERTILIZERS**

**SUGAR, CEMENT**

**PHARMACEUTICALS**

**DYES & INTERMEDIATES**

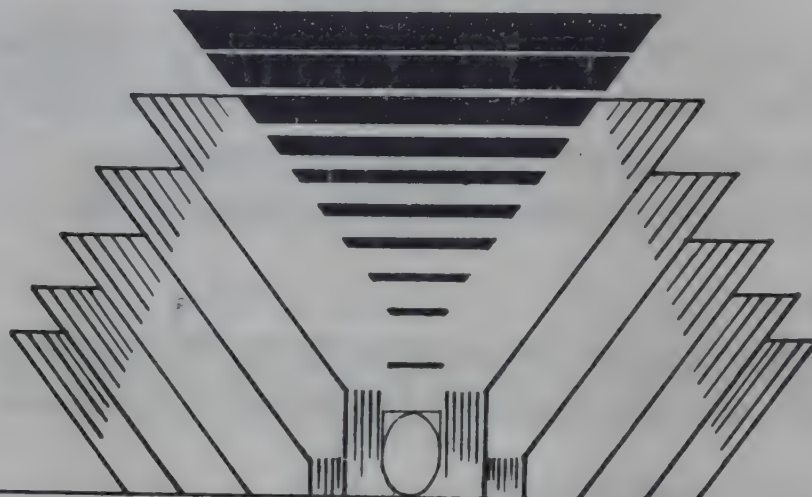
**OTHER INDUSTRIES**

In the multifarious world of  
industrial filtration, one name  
strikes the right chord

**PROFIL<sup>®</sup> FILTER FABRICS**



Dedication  
to better  
Filtration



• Wide Range  
Polypropylene, Cotton, Polyester,  
HDPE, Spun and Multifilament.

• Made to order  
Filter fabrics that are  
processed, fabricated and  
sized exactly to your  
machine's specifications.  
• Extensive distribution facilities.  
• Guaranteed quality and prompt  
after sales service

**KHOSLA FILTERS  
PRIVATE LIMITED**

Head Office 3/623, Navjivan,  
Lamington Road, Bombay-400 008  
Phones: 897012 • 897320  
Grams: KHOFIL Telex 011-76780-ID IN

## QUALITY LABORATORIES SCIENTIFIC INSTRUMENTS

Autoclaves

Baths (Water, Oil, Viscosity, Low Temp.)

Colorimeters

Furnaces

Incubators

(Bacteriological, B.O.D.)

Micro-Litre Syringes (for G.C.  
& H.P.L.C.)

Ovens

Petroleum Testing Instruments

Pumps, Vacuum

Stirrers (Overhead, Magnetic)

Thermometers (Stem type, inclusion, as  
per IP and ASTM)

Water Stills

Balances (Two-pan, Single-pan)

Centrifuges (all types)

Conductivity meters

Hot Plates & Heating Mantles

Karl Fisher Titrators

Microscopes (mono, Bino, Stereo &  
Research)

pH Meters

Polarimeters

Refractometers (Abbes)

Tapes (Heating)

Viscometers

**C. ABHAYKUMAR & CO.**

Gopal Nivas, 127, S. Gandhi Marg, Bombay 400 002.

Gram: 'JITMARA'

Telephone: 316397/295184



# Quality That Abounds in Quantity.

Recipient of the following prestigious awards :

- Sir P.C. Ray Award, 1985 of ICMA for development of indigenous technology.
- ASIA Award, 1986 • EUROPA Award, 1987

**Patronise DACL'S  
Ethyleneamines.**

**Ethylenediamine (EDA)**

**Diethylenetriamine (DETA)**

**Triethylenetetramine (TETA)**

**Tetraethylenepentamine (TEPA)**

**Higher Polyamines Mix (PA)**

**Piperazine (PIP)**

**of International standards.**



## Diamines and Chemicals Limited

**REG. OFFICE :** In the premises of The Bharat Vijay Mills Ltd.,  
Kalol (N.G.) 382 721.

**AHMEDABAD :** Head Office : 1, National Chambers, 2nd Floor, Ashram  
Road, Ahmedabad - 380 009. Phone : 409626. Gram : 'DIAMINES'

**BARODA :** Plot No. 13, P.O. Petrofils-391 347. Dist. Baroda,  
Phone : 73305. 73406. Gram : 'DIAMINES' Telex No. 0175-352 DACL IN

**BOMBAY :** Mittal Towers, 'C' Wing, 8th Floor, Nariman Point, Bombay  
400 021. Phone : 232267 Gram : 'CELAGAR'.

**NEW DELHI:** M/s. Joshi & Associates, 20, Ansari Road, Near Fire Station,  
Darya Ganj, New Delhi-110 002. Phone: 263502. Gram: MARTALUMIN.



FOR YOUR REGULAR REQUIREMENTS OF

**OXALIC ACID, DIETHYL OXALATE  
ACETIC ACID, ETHYL ACETATE  
& BUTYL ACETATE**

CONTACT MANUFACTURERS:

**The Sanjivani (Takli) Sahakari Sakhar Karkhana Ltd.**

Sahajanand Nagar, P.O. Singanapur, Tal. Kopargaon,  
District: Ahmednagar, (Maharashtra State)

Phone: 334, 391, 305, 208 (Kopargaon)  
6125614 (Bombay)

Gram: "SANJIVANI"  
SHINGANAPUR

Available At Most Competitive Rates

**Sodium Sulpha Hydrate Solution  
30-32% [NaHS]**

(AN EXCELLENT REDUCING AGENT)

**Rubber Chemicals** (BAYER)

**Carbon Black** (HI-TECH CARBON)

**Stearic Acids** All Grades

**Zinc Oxide** (BHARAT)

**Sulphur** (SOLAR)

Please Contact:

**Jagdishprasad Vijaykumar**

Gram: BHIMRAJKA

708, Maker Chambers V, Nariman Point, Bombay - 400 021

Phones: 2044476/2048289

Telex: 011-2222

Consignment Agents For:

**BAYER (INDIA) LIMITED**

**HI-TECH CARBON**





## The Planet Earth is the greatest chemist we know.

What fecund and creative chemistry. Every human, plant, animal, rock, gas or liquid on earth has a simple or complex chemistry behind it. The idea of so much thought and unconscious formulation seems mind-boggling, but Nature does it regularly and effortlessly. It inspires us.

Process chemicals for the textile industry for Sizing, Desizing, Mercerising, Scouring, Dyeing, Printing and Finishing.

**SUPERTEX**™

**SUPERTEX**®

(INDIA) CORPORATION

132, Dr. Annie Besant Road, Bombay-400 018  
Phone: 493 6041, 493 38 18, 493 5482.  
Grams: 'Thinogum'. Telex: 75643.

a M.C. Saraf Enterprise  
Most trusted name in chemicals.



AVAILABLE FROM READY STOCK AT COMPETITIVE RATES

Aniline Oil  
Butyl Acetate  
Carbitol \* Cellosolve  
Di Octyl Phthalate  
Ethyl Acetate  
Iso Propyl Alcohol  
N-Propanol \* Acetone  
Chloroform  
Cresol (Technical)  
Dimethylamine  
Di Butyl Phthalate

Ether Solvent  
Iso Propylamine  
N-Heptane \* Sorbitol  
Butanol-N/Iso  
Carbon Tetra Chloride  
Carbon Di-Sulphide  
Diethnaolamine  
Diethylene Glycol  
Ethylene Di Chloride  
Nitrobenzene  
Oleic Acid Pure/Tech

Methanol \* Pyridine  
Methylene Dichloride  
Perchloro Ethylene  
Pine Oil Commercial  
1-1-1 Trichloro Ethane  
Toluene  
Triethylamine  
Soyalecithin  
Monoethanolamine  
Thionyl Chloride  
Trichloro Ethane

Please Contact:

## M/S. MAKS CHEM INDUSTRIES

89, Princess Street, 2nd Floor, Pirbhoy Mansion, Bombay-400 002

Phones: Off: 312358/257898/254363; Resi: Mr. K.L. Shah -- 6885928/690131; Mr. M.L. Shah -- 6126969; Gram: MAK SOL

WE BUY CHEMICAL WASTE & DISTILLED SOLVENTS REGULARLY

For Your Bulk Requirements Of:

- 1) FATTY ACIDS : Oleic, Recenolic, Linoleinic, Linseed Oil, Fatty Acid & Coconut Fatty Acid.
- 2) METALLIC STEARATES : Lead, Calcium, Barium, Cadmium, Zinc, Aluminium etc.
- 3) PVC STABILISERS : **Solid:** TBLS, DBLS, DBLP, LS, CS & Package Stabilisers for Rigid PVC Pipes & cable Industries  
**Liquid:** Barium, Cadmium, Liquid Stabilisers i.e. BCP 986, BC 026, Chelators.
- 4) ORGANO TIN STABILISERS : Toxic, Non-Toxic & Non-Sulphur

Kindly Contact Manufacturers:

## M.G. CHEMICALS & OXIDES

Regd. Office: A-10/3, Indrayuda Housing Society, M.G. Road, Goregaon (W), Bombay 400 090.

Phones: 697514, 6722018

Admn. Office: G-42, D-Wing, Dewan Apts. No. II, Navghar, Vasai Road (East), Thane.  
Vasai Phone: 944.

Actual Consumers / Export Houses / Reputed Traders

For Your Requirement of:

**SODIUM CHLORITE 80%/50% Flaky Powder**  
**MAULIBLEACH - H (For extraordinary bleaching)**

Please Contact Manufacturer:

## M/s. MAULIKEM PRODUCTS

C-1, 5515, GIDC Estate, Phase-III, Vatva, AHMEDABAD 382 445  
Phones: C/o. 831333 (F), 53841 (R), 22046 (O)

Our Stockists:

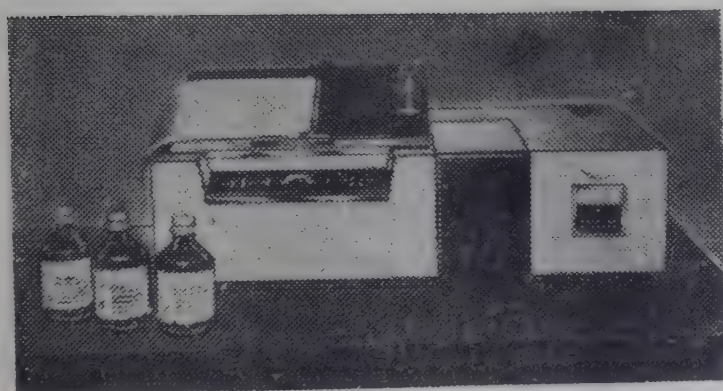
M/s. KUMAR BROS., Katra Hari Singh, Amritsar. Phone: 33445  
M/s. LAXMI & CO., 361, Jawahar Marg, Indore. Phone: 34845

M/s. THERNARI COLOUR CHEM, 9/467, Kot Street, Opp. Air India, Surat. Phone: 27638  
M/s. JALAN DYE-CHEM INDUSTRIES, 333, Samuel Street, Mahavir Chambers, Bombay. Phone: 326296  
M/s. JALAN LUDHIANAWALA & CO., B-H-21, Shalimar Baugh, Delhi. Phone: 7110960  
M/s. ADITYA CORPORATION, Satelite Road, Nr. Jodhapur Tekra, Ahmedabad.



The lowest %, the highest marks !

# Lowest % absorption gives **RANBAXY'S** Solvents for Spectroscopy highest marks for accuracy!



Ranbaxy's solvents for spectroscopy give minimum absorbance at specified wavelengths leading to optimum accuracy. Currently available is the following range of solvents:

- |                           |                   |
|---------------------------|-------------------|
| ■ ACETONE                 | ■ DICHLOROMETHANE |
| ■ BENZENE                 | ■ ETHYL ACETATE   |
| ■ CARBON<br>TETRACHLORIDE | ■ METHANOL        |
| ■ CHLOROFORM              | ■ iso-PROPANOI    |

Put **RANBAXY** Reliability in your Laboratory!



*For your requirements, please contact :*



**RANBAXY**  
LABORATORIES LIMITED

CHEMICAL DIVISION MARKETING OFFICE  
16, MARINA ARCADE, CONNAUGHT CIRCUS  
NEW DELHI - 110 001  
Phones : 323738, 323739; Telex : 031 4220  
Cable : RANBAXYLAB CONNAUGHT CIRCUS



FOR YOUR REGULAR SUPPLIES OF  
**OLEUM 23/25% & SULPHURIC ACID 98%**  
**SULPHURIC ACID BATTERY GRADE (CONC.)**

PLEASE CONTACT THE MANUFACTURERS:

## **GOPALANAND RASAYAN**

(A Division of the Indian Link Chain Mfg. Ltd.)

We ensure:

- \* REGULAR SUPPLIES ON LONG TERM BASIS
- \* MEETING WITH ALL I.S.I. SPECIFICATIONS
- \* PROMPT DELIVERY AS PER YOUR SCHEDULE

**Registered Office:**

Lal Bahadur Shastri Marg,  
Bombay 400 078.

Phones: 582311/582312

**Marketing Division:**

Sonawala Building,  
2nd Floor, 59, B.S. Marg,  
Bombay 400 003.

Phone: 256519/317387

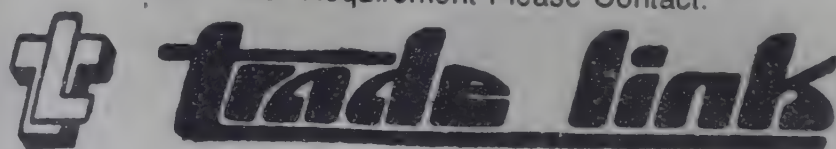
**Factory:**

Plot No. D-18, MIDC Area  
Tarapur, P.O. Boisar 401 506.

Phone: 421/422

**BENZALDEHYDE**  
**1:5 NAPHTHALENE DI-SULPHONIC ACID** (ARMSTRONG ACID)  
**PROPENYL -- GUAETHOL**  
**TRICRESYL PHOSPHATE \* CELLOSOLVE ACETATE**  
**BENZYL ACETATE FFC \* BENZYL ALCOHOL FFC**  
**BENZYL BENZOATE \* BENZYL SALICYLATE**

For Your Requirement Please Contact:

The logo for Trade Link features a stylized 't' inside a square frame, followed by the words 'trade link' in a bold, italicized, sans-serif font.

5/363, Mangaldas Building, Trikamji Ghia Marg, 2nd Floor, BOMBAY - 400 002.  
Phone: 297718/259487; Resl.: 473310

Gram: 'POLOSIGHT'

TELEX: 4258 PTK IN

**COPPER SALTS (Re-introducing)**

COPPER SULPHATE  
COPPER CHROMATE  
COPPER ACETATE  
COPPER NITRATE  
COPPER CARBONATE

**MERCURY SALTS:**

MERCURIC CHLORIDE  
MERCURIC OXIDE

For Your Requirements of:

MERCURIC ACETATE  
MERCURIC SULPHATE  
MERCURIC IODIDE  
MERCURIC THIOCYANATE  
MERCURIC NITRATE

**LEAD SALTS:**

LEAD ACETATE  
LEAD PEROXIDE  
LEAD NITRATE  
LEAD CHLORIDE

**LEAD PHOSPHATE  
TARTARATES:**

SODIUM POTASSIUM  
TARTARATE  
AMMONIUM TARTARATE  
SODIUM BITARTARATE  
&

ALL TYPES OF CHROMATES  
PHOSPHATES, STRONTIUM  
SALTS ETC.

Please Contact Manufacturers For Competitive Prices:

## **L. S. Chemicals & Pharmaceuticals**

10, Kotkar Industrial Estate, Off: Aarey Road, Goregaon (East), Bombay - 400 063  
Tel.: Factory: 692391

Resl.: 625735



# H.D.P. WHITE & BLACK JERRY CANS, CARBOYS & JARS

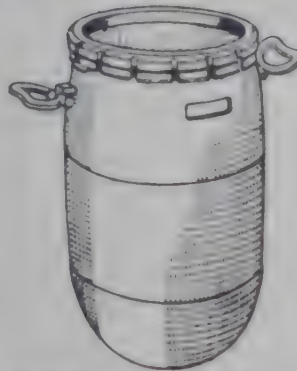
from PIL'S Virgin material  
manufactured on IMPORTED Machines



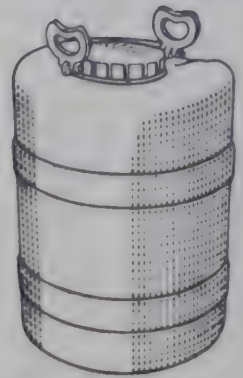
50 Ltrs. Jerry Can



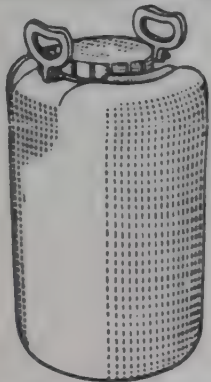
50 Kgs. Round Drum  
Full Top Open - 12" Cap



30 Kgs. Round Drum  
Full Top Open - 10" Cap



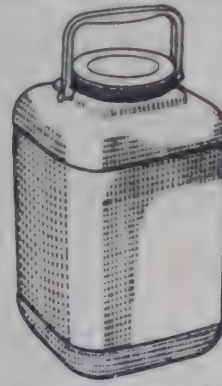
50 Kgs. Round Drum  
- 6" Cap



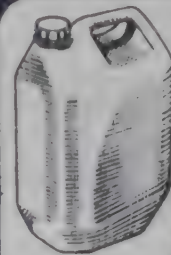
30 Kgs. Round Jar  
- 6" Cap



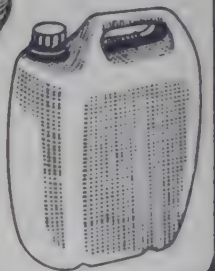
20 Kgs. Round Jar  
- 6" Cap



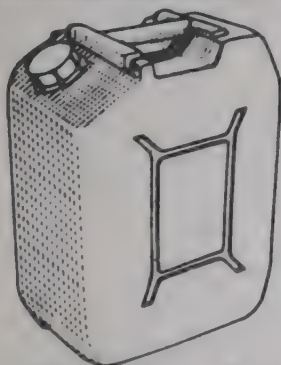
6 Kgs. Square Jar  
- 4" Cap



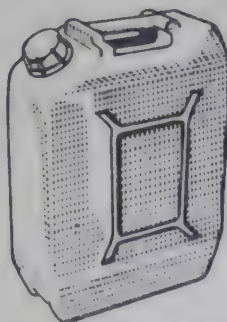
5 Ltrs.  
Jerry Can



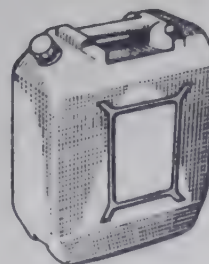
6 Ltrs.  
Jerry Can



30 Ltrs. Jerry Can  
Stackable



20 Ltrs. Jerry Can  
Stackable



10 Ltrs. Jerry Can  
Stackable



1 Ltr.  
Jerry Can



2.5 Ltrs.  
Jerry Can

**Rajdeep  
Plastics**

FOR YOUR REQUIREMENTS KINDLY CONTACT  
17, JAMNADAS INDUSTRIAL ESTATE,  
OPP. JAWAHAR TALKIES, DR. R.P. ROAD,  
MULUND (W), BOMBAY 400 080.  
PHONES: 5613344 • 5616688



For Your Regular Requirements of:

# ACTIVATED CARBON



Please Contact Manufacturers

**M/s. AMAR INDUSTRIAL & FINE CHEMICALS**

Head Office: 2, Sundaram Building, Sion Circle, Bombay - 400 022.

Phones: 475189/472586/477054

Grams: "ACTSAMAR"

Factory: Bye-Pass Road, Hoshiarpur - 146 001 (Punjab)

Phone: 3111

Grams: "ACTSAMAR"

**LEADING MANUFACTURER OF QUALITY ACTIVATED CARBON OF  
VARIOUS GRADES SINCE OVER A DECADE.  
EQUIVALANT TO INTERNATIONAL STANDARDS**

## *Alpha Naphthylamine*

(Special)

(Beta Content Less than 0.5%)

Manufactured By:

**Heerasons Chemicals Pvt. Ltd.**

A/7, Maroli Udyognagar,

Maroli Bazar - 396 436

Dist. Valsad,

GUJARAT

Phone: 62, Maroll.

**SUCCINIC ACID  
POTASSIUM PERSULPHATE  
POTASSIUM IODATE  
POTASSIUM BROMATE**

Directly from manufacturers:

**R.B. CHEMICALS & AGRO INDUSTRIES PVT. LTD.**

703, Dalamal House, 206, Nariman Point, Bombay 400 021

Tel: 244335 / 223148

Tlx: 11-5474 RB IN

Gram: WORKSTUDY, Bombay 400 021





*Connected to one of the oldest industries in the world, which incidentally is also the youngest.*

*From ancient garments made of bark and hide, through historical finds of Chinese silk and Egyptian cotton at burial sites, to modern fabrics made on computerized looms, humankind's relations with clothes are as old as civilization. From the time when lamp-black, powdered lapis lazuli, red ochre, dye secretions of the banded murex snail, indigo and other plant, mineral and animal dyes have been used, human fascination with colouring agents is also well known.*

*We at Texchem continue this odyssey, this quest for cloth and its colour.*

*Process chemicals for the textile industry for Sizing, Desizing, Scouring, Mercerising, Dyeing, Printing and Finishing.*

TEXCHEM<sup>®</sup>

TEXCHEM<sup>®</sup>

182, Dr. Annie Besant Road, Bombay-400 018

Phone: 298 6011, 298 8818, 298 5482.

Grams: 'Thinogum'. Telex: 75678.

*a M.G. Sargol Enterprise*

*Most trusted name in chemicals.*



FOR YOUR REQUIREMENTS OF:

- \* Reactive Turquoise Blue H5G, H7G, H2G
- \* Vinyl Sulphone Dyes--Turquoise Blue G
- \* Direct Turquoise Blue
- \* Navy Blue RX
- \* Reactive Turquoise Blue MG

FOR EXPORT

**CI BLUE--25**  
**CI BLUE--21**  
**CI BLUE--86**

Contact Manufacturers:

**At Bombay Office:**

## **KUSUM DYE-CHEM INDUSTRIES**

**Office:**

77/87, Abhechand Gandhi Marg,  
Shreeji Krupa Building,  
Room No. 21, 2nd floor, Bombay-400 003  
Tel: 342466/324526, C/o. 345512

**Factory:**

Plot No. 303/8/D, G.I.D.C., Vapi,  
Dist. Bulsar, Gujarat, Pin-396 195  
Phone: Resi: 5610860  
(Export enquiries also solicited)

For Your Requirements Of:

## **OPTIKOL<sup>®</sup> WHITENING AGENT**

For Textile, Paper & Detergent Industry

### **BASIC AUROAMINE 'O'**

Full Range of

BHAVITHOLS (Naphthols)

BHAVI FAST BASES

BHAVICTIVE (Reactive)

ACID -- BASIC -- DIRECT

BHAVIZOL (Vinyl Sulphone Base)

Please Contact:

## **BHAVI ENTERPRISES**

12, Gaya Building, 3rd Floor, 109, Yusuf Meherali Road,  
BOMBAY - 400 003

Tele:327626/345940

Resi: 576807

Telex:011-76830 CHEM IN

**EXPORT ENQUIRIES SOLICITED**

For Your Regular Requirements of:

DI-OCTYL SEBACATE  
DI-OCTYL PHTHALATE  
DI-OCTYL ADIPATE  
OCTYL STEARATE  
DI-OCTYL MALEATE  
CASHEW NUT SHELL OIL

DI-BUTYL PHTHALATE  
DI-BUTYL ADIPATE  
DI-BUTYL SEBACATE  
BUTYL STEARATE  
DI-BUTYL MALEATE

Please Contact Manufacturers:

## **Enbichem Industries**

P.O. Bag No. 7039, 219-224, Madhani Estate,  
542, Senapati Bapat Marg, Dadar, BOMBAY-400 028  
Telephones: 422 53 92 / 422 89 68



# Some of the best known, finest quality and most reasonably priced chemicals have one thing in common: the Atul name.

## Dyestuffs

For Cotton Textiles, Viscose Wool, Silk, Paper, Jute, Leather and Man-Made Fibres: Acid Dyes, Metalan Dyes (1:2 Metal Complex Dyes), Metalex Dyes (1:1 Metal Complex Dyes), Tulachrome Dyes (Mordant Dyes), Direct Dyes, Direct Fast, Direct Light Fast and Direct Supra Light Fast Dyes, Tulathols, Tulabases, Tulaprint Pigment — Emulsions, Tulagenes (Rapid Fast), Sulphur Black (Grains & Powder) Basic Dye — Bismark Brown R. Disperse Dyes: Tulaceron for Acetate, Tulasteron for Polyester, Tulanyron for Polyamide, Oil Dyes.

## Fluorescent Whitening Agents

For Paper: Swetak CT  
For Cotton: Textiles & Viscose: Swetak MNA and Swetak CR  
For Polyamide: Swetak NR  
For Polyester: Swetak PE-R

## Pharmaceuticals

Quiniodochlor I.P., Nikethamide I.P., Saccharin Insoluble, Saccharin Sodium I.P., Halazone N.F., Tolbutamide I.P.

## Pharmaceutical Intermediates

Dicalcium Phosphate (Dentifrice Grade), Dicalcium Phosphate (I.P. Grade), Methyl Dichloro Acetate, Toly-p-Sulphonyl Ethyl Carbamate Para Chlorobenzene Sulphonamide, Para Toluene Sulphonamide, Para Toluene Sulphonyl Chloride Ortho Toluene Sulphonamide and Urethane.

## Dyes Intermediates

Beta Naphthol, B.O.N. Acid, Chicago Acid, Metanitroaniline G. Salt, Gamma Acid, H. Acid,

J. Acid, J. Acid Urea, Phenyl J. Acid, Rhoduline Acid, Metaphenylenediamine (Distilled) Peri Acid, Schaeffer's Acid, Phenyl Peri Acid, Sodium Naphthionate, Sulphanilic Acid, Tobias Acid, Mitchler's Ketone Mono Ethyl Aniline, R.Salt Para Nitro Aniline (Technical), Meta Nitro Para Toluidine Para Cresidine, 2-Naphthylamine 1:5 Di-Sulphonic Acid, 2-Naphthylamine 3:6:8 Tri-Sulphonic Acid, N Methyl J. Acid (Pure), 2-Aminophenol-4-Sulphonic Acid, 5-Sulpho Anthranilic Acid.

## Chemicals

Sulphuric Acid, Chlorosulphonic Acid, Oleum 25%, Oleum 65%, Hydrochloric Acid 30%, Caustic Soda Lye (Rayon Grade), Caustic Soda Flakes (Rayon Grade), Potassium Hydroxide Flakes, Chlorine, Phosgene, Methyl Chloroformate, Ethyl Chloroformate, Phosphorous Trichloride, Sodium Thiosulphate (HYPO) Crystals and Powder and 2:4 Dichlorophenol.

## Weedicide

2:4:D Sodium (Technical)

For your requirements please contact:

MARKETING DEPARTMENT



P.O. Atul - 396 020, Gujarat (India).  
Phone: ATUL 261 to 265  
Grams: 'TULA' ATUL  
Telex: 0173-232 Atul In.



*Now Available Regularly*

JAPAN LIKE QUALITY

## ORTHO DIANISIDINE BASE

(Fast Blue B Base)

Export Enquiries Are Solicited

CONTACT:

### Chemical Industrial Corporation

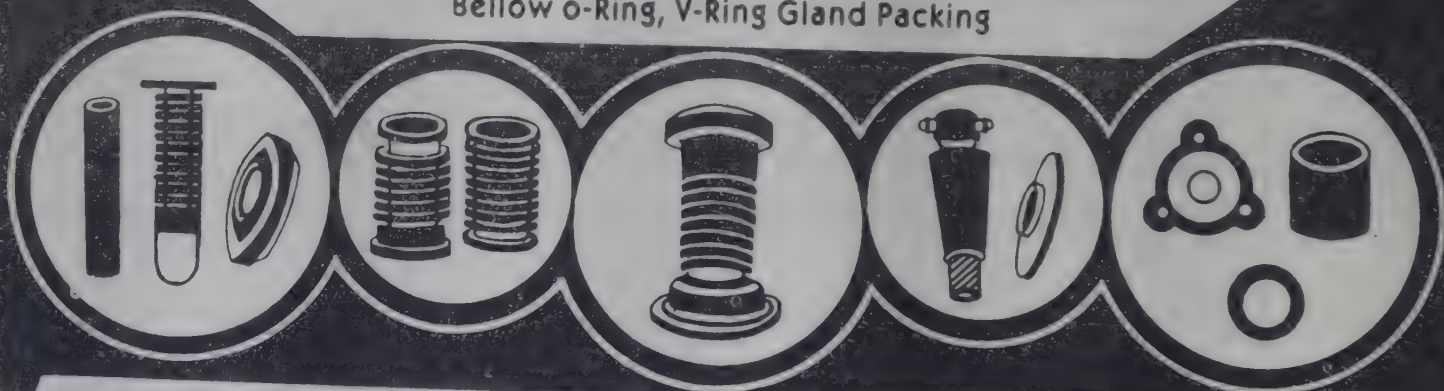
288, Samuel Street, Vadgadi, Bombay - 400 003

Phones: 322303 \* 342754 \* 322511

### VIJAY MECHANICAL & PACKING WORKS

MOULDERS & FABRICATORS OF P.T.F.E-TEFLON —FLUON

Expansion Bellow, Valve Bellow Gasket, Creascent Ring, Stirrer  
Bellow o-Ring, V-Ring Gland Packing



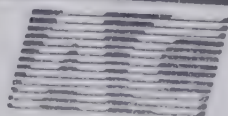
OFFICE : Building No. 174/5905,  
Kannamwar Nagar No.1, Vikhroli, (E)  
Bombay -400 083. Phone : 58 29 69

WORKS : Shed No. W-9 (A) M.I.D.C.  
Murbad, Near Kalyan  
Dist.: THANA

# POTASSIUM NITRATE

You name the specification, we have it.

Contact



## Akshay Chemicals

205, Kashyap Complex, Jetalpur Road, BARODA-390 005.

Telephone 325988 Gram : PONIT



# PARACETAMOL

IP/BP

## CHEMICAL Formula

Acetaminophen

4' — Hydroxyacetanilide

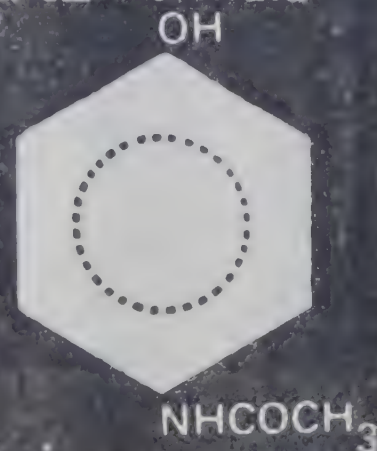
P — acetylaminophenol

N — Acetyl p-aminophenol

P — acetaminophenol

P — acetamidophenol

## STRUCTURAL Formula



## MANUFACTURAL Formula

# farmson

## THE PERFECT PRODUCT OF

# farmson

## Pharmaceutical Gujarat Pvt. Ltd.



**Head Office :** Shankar Bhuvan, Sayaji Gunj, Vadodara-390 005, Phones : 65636, 64169, Gram : FARMSON

**Works :** 98/1-2-3-4, GIDC Industrial Estate, Nandesari, Dist. Vadodara, Phone : 219

**Research Centre :** At. Narpura, Post Baska, Tal. Halol, Dist. PANCHMAHALS

**SALES OFFICES :**

**Bombay :** 404, Embassy Centre, Nariman Point, Bombay-400 021, Phones : 231144, 230383, Gram : KEKEVIT

**Hyderabad :** 1-1-700/B-1, New Bakaram, Hyderabad-500 380, Phone : 65836, Gram : FARMSON

### Regional Representatives

- KHOKHANI ASSOCIATES, 3rd Floor, Keshav Baug, 116-Princess Street, BOMBAY-400 002  
Tele. No. 252244, 252688
- PAN ASIAN Commercial Corporation, 4, Rabindra Sarani, CALCUTTA-700 001  
Tele. No : 277595-475047, Cable : PANASIAN
- B&I Enterprise, Cama Building, 2nd Floor, 24/26 Dalal Street, BOMBAY-400 023  
Tele. No : 271964
- NEELGIRI AGENCY, B-5, Shivlok House-1, Karampura Comm. Centre, Opp: Milan Cinema,  
Najafgarh Road, NEW DELHI-110 015. Tele. No : 5413818

NIRMAL

# The Biggest Manufacturer of India



FOR YOUR REQUIREMENTS OF:

HYFLOSUPERCELL  
POTASSIUM FERROCYANIDE  
MALEIC ANHYDRIDE  
MELAMINE  
THIOUREA  
CITRIC ACID

TARTARIC ACID  
PECTIN  
SOYA LECITHIN  
FORMIC ACID  
AMMONIA BICARB  
ACRYLAMIDE

DIMETHYL AMINE (RCF)  
GLYOXAL 40%  
PARAFORMALDEHYDE  
ACETONE  
PENTAERYTHRITOL  
SODIUM GLUCONATE

Please Contact:

## JAYDIP AGENCIES

2-B, Ganga Vihar, 94, Kazi Sayed Street, Bombay 400 003.

Phone: Office: 343316/331357; Resl: 6366280.

Gram: "JAYDIPIMPO", Bombay-5

OUR ASSOCIATES: M/s. VASANI I. MEHTA

For Your Regular Requirement Of:

PHENOTHIAZINE PURE  
LITHIUM BROMIDE  
ZINC PHOSPHATE  
PHENYL HYDRAZINE HYDROCHLORIDE  
CREATININE (AUSTRIA)

SODIUM METABISULPHITE  
POTASSIUM META BISULPHITE  
LITHIUM CARBONATE  
MEGALDRATE USP  
ISOSORBIDE DINITRATE 40%

HYDROXYLAMINE HYDROCHLORIDE  
SODIUM SULPHITE -- SUPER FINE (PHOTO GRADE)  
SODIUM FORMALDEHYDE BISULPHITE (PHOTO GRADE)  
AMMONIUM THIOSULPHITE 60% (PHOTO GRADE)  
LITHIUM CHLORIDE (MONO/ANHYD) (PHOTO GRADE)  
SODIUM CARBONATE (MONO/ANHYD) (PHOTO GRADE)

Please Contact authorised manufacturers Agent

## M/s. GAURAV ENTERPRISE

33, Sarvodaya Charity Trust Building, Gokhale Road (South), Dadar, BOMBAY 400 028.  
Telephones: 4309513/4309597. Telegram: PUSHPACHEM -- Bombay-28. Telex: 011-71043 GAME IN  
In Baroda Contact: Mr. JAYESH H. SHAH, 307, Sitaram Apartments. Near Manusmruti Hospital  
Ellora Park, Baroda 390 007. Phone: 322670

FOR YOUR BULK REQUIREMENTS AT MOST REASONABLE & COMPETITIVE RATES IN:

### RAMAZOL DYES

- \* YELLOW F.G.
- \* BLACK B
- \* ORANGE 3R
- \* VIOLET 5R
- \* GOLDEN YELLOW R
- \* RED 5B
- \* RED C2G
- \* BROWN GR
- \* BLUE 3R
- \* YELLOW RTN
- \* GOLDEN YELLOW G
- \* YELLOW GN

### REACTIVE DYES

- \* RED M5B
- \* YELLOW H4G
- \* BLACK HN
- \* RED BROWN H4R
- \* NAVY BLUE RX
- \* GOLDEN YELLOW HR

### CHROME DYES

- \* CHROME BLACK T
- \* CHROME BROWN 2R

### ACID DYES

- \* ACID SCARLET 3R
- \* ACID BLACK 10BX
- \* ACID ORANGE II

EXPORTERS'  
ENQUIRIES  
SOLICITED

PROMPT SERVICE  
OFFERED.

Please Contact MANUFACTURERS:

## ABHINAV INDUSTRIES

K1/4, G.I.D.C. Estate, Behind Vinal Water Tank, Naroda, Ahmedabad 382 330  
Phone: 813645

(KNS-ADI)



USED DILUTE TEXTILE AUXILIARIES

TEXTILE MILL



I USED CONCENTRATED TEXTILE AUXILIARIES

TEXTILE MILL



CHOICE IS YOURS

**SAVE 50% By Using our 100% Concentrate Products**

**100% SOFTNER (Reactive)**

**100% SOFTNER HCS (TARWALA) (Cationic)**

**100% SOFTNER (Nonionic)**

For Free Samples & Demonstration

Contact Manufacturers

**C. RAJA & CO.**

5, Dev Chhaya, 120, Keluskar Road, Shivaji Park, Bombay 400 028.

Tel.: 464351/453300.

**EXCELLENT AFTER SALE TECHNICAL SERVICES**



Available

# **SORBITOL -- Liquid/Powder VITAMIN 'C' -- Plain/Coated**

**SODIUM BENZOATE I.P.**

**SULPHURYL CHLORIDE**

**BILE SALT**

**BHT (Butylated Hydroxy Toluene)**

Please Contact:

## **MATANGI TRADING CORPORATION**

2-A/B, Pahlaj Kunj, Shivaji Path, Opp. Laxmi Book Depot, Thane (West) - 400 601  
Phones: 595720/505559; Resi: 5615731/594517. Cable: 'MATANGI'

FOR YOUR REQUIREMENTS OF:

**Ammonia Gas**

PURITY 99.5% IN CYLINDERS OF 40 & 50 KGS  
ROAD TANKERS OF 5, 6, 7 M.T.

**Ammonia Liquor**

SPECIFIC GRAVITY 0.910 & 0.888 IN ROAD  
TANKERS, 7-9 M.T. DRUMS, CARBOYS & BOTTLES

Please Contact: **ASCO CHEMICAL COMPANY**

61, Bombay Talkies Compound, Post Box No. 17629, Malad (West), BOMBAY - 400 064.  
Telephones: Off.: 6820151/6821667; Resi: 6265775. Grams: "PAGODA" Malad, Bombay-64  
Factory: Plot No. 4, Mira Co-op. Industrial Estate, Mira, Dist. Thane. Telephone: 663691

And Also Available At Ankleshwar (Guj).

## **ANKLESHWAR AMMONIA SUPPLY CO.**

Plot No. 6508, GIDC, Ankleshwar, Gujarat  
Tele: C/o. 2828 -- ANKLESHWAR

**PETROLEUM ETHER (L.R./A.R.)** 40-60°/60-80°/60-95°/80-100°/80-120°/95-110°/100-120°

**n-HEXANE** (65-70°)

**EMULSIFYING WAX**

**n-HEPTANE** (90-100°)

**Ethyl Acetate**

**Methyl Acetate 98%**

**Iso Amyl Acetate (Perfumery Grade)**

**Ethyl Butyrate**

**Amyl Butyrate**

**Schaeffer's Acid (As Sodium Salt)**

Also Available in Bulk L.R./A.R. Grades  
CYCLOHEXANE \* XYLENE 138°-142° (Rectified -- Sulphur Free) \* TOLUENE (Rectified  
Sulphur Free) \* DIMETHYL FORMAMIDE \* CYCLOHEXANONE \* ACETONE \* ACETIC ACID  
BENZENE \* ISOPROPANOL \* METHANOL

For MODVAT benefit excise gate pass will be issued

Contact Manufacturers:

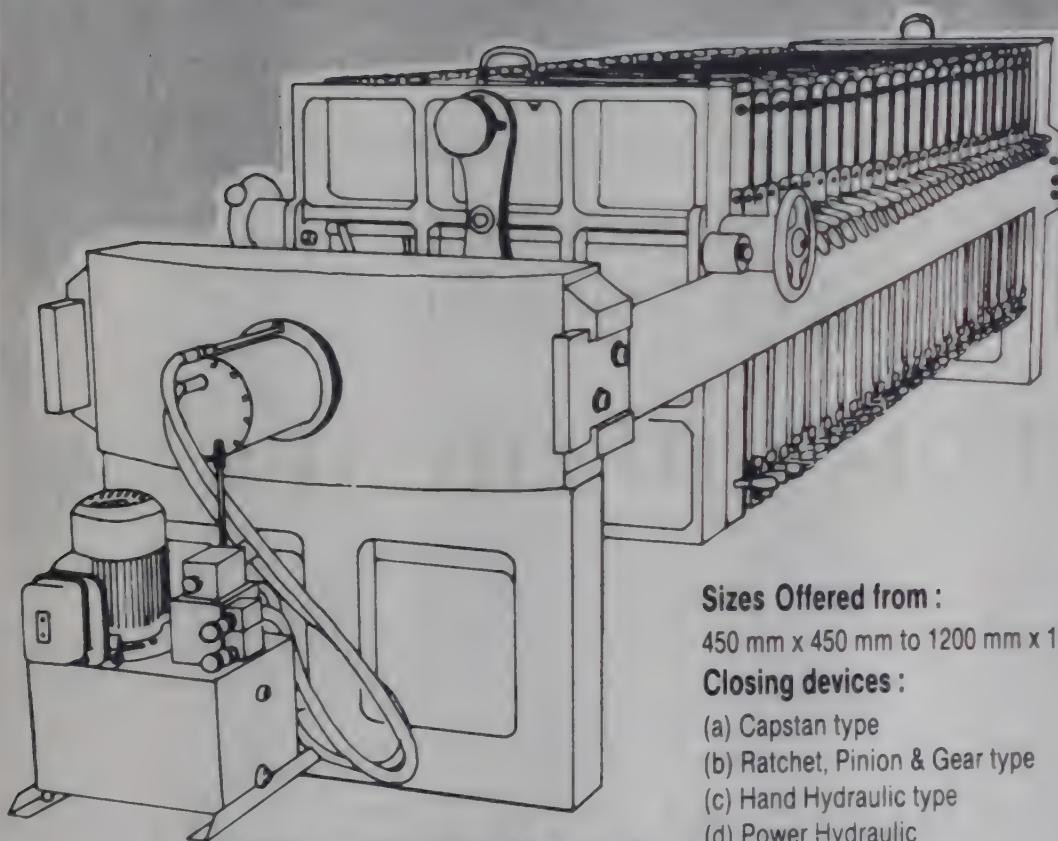
## **STERLING ORGO & INORGO CHEMICAL PVT. LTD.**

Regd. Office: 340/42, Samuel Street, Raut Chamber, 4th Floor, Bombay 400 003.  
Phones: 333601/333602/338722; Resi: 352625/364354/8114061

Factory: Plot AF-1, Cama Industrial Estate, Walbhat Road, Goregaon (East), Bombay - 400 063.  
Phone: 699458/6884593



# In a world that is hard pressed for quality...



## High quality filter presses & wooden vats from NMP Group

for efficient and economical separation of solids and liquids.



**FILTER PRESSES  
& WOODEN VATS**

**THE PIONEERS IN THE FIELD**

### Sizes Offered from :

450 mm x 450 mm to 1200 mm x 1200 mm

### Closing devices :

- (a) Capstan type
- (b) Ratchet, Pinion & Gear type
- (c) Hand Hydraulic type
- (d) Power Hydraulic

### Construction materials :

- Wood
- Cast Iron
- Polypropylene

### Wooden vats :

Size 250 litres to 60,000 litres.

### M/S. Nanubhai Mavjibhai Patel

P.B. NO. 46, Near Railway Crossing,

Billimora 396 321 (Guj.)

Telegram : 'PANAMA'

Telephone : 3680/2148



For Your Requirements Of:

**ZINC ASH, ZINC DUST, ZINC OXIDE (OFF COLOUR)**  
**BRASS ASH & COPPER ASH**

Very Suitable for

**Zinc Sulphate & Copper Sulphate**

WE PURCHASE

Scrap -- Waste -- Ash -- Residues of

NICKEL -- TIN -- COBALT AND OTHER NON-FERROUS METALS

Please Contact: **HINDUSTAN METALS**

13, Broadway Shopping Centre, 1st Floor, Dadar T.T., Bombay-400 014

Gram: 'RESIDUE' Bombay-400 014

Phones: 4121356/4127014

For Your Requirements Of:

**Copper Phthalocyanine Crude (CPC)**  
**Copper Phthalocyanine Blue**  
**(ALFA Pigment)**

Please Contact:

**AEGIS CHEMICALS**

Factory:

Shed No. C-1/B, 351,  
Phase-II, G.I.D.C. Estate,  
Vatva, Ahmedabad 382 445.  
Telephone No.: 877437

Office:

1295, Madan Gopal Haveli Road,  
Opp. Hanuman's Temple,  
Astodia, Ahmedabad 380 001.  
Telephone No. 344504/345031

**MANGANESE SULPHATE -- 98%**

**MONO HYDRATE**

( $\text{Mn SO}_4 \cdot \text{H}_2\text{O}$ ) --- Mn 32%

MANUFACTURERS

**KUM INDUSTRIES**

1009/2, VINOD BUILDING,

DEEP BUNGALOW CHOWK, PUNE - 411 016

PHONE: OFFICE: 53129

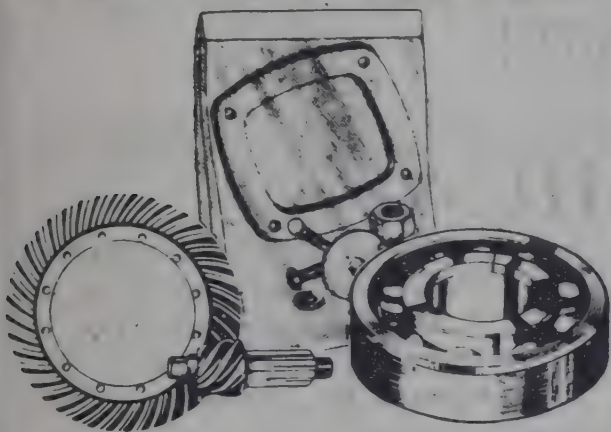
FACTORY: 84874



**Corrosion kills  
engineering  
excellence.**

**Protect engineering  
excellence with**

**ALCHAN<sup>®</sup>**



Engineering excellence can suffer due to corrosion.

Alchan corrosion inhibitors put an effective end to corrosive attack.

A monomolecular coating controls corrosion problems.

Alchan comes to you as powder (in bulk and in pouches) and as oil & water soluble solutions.

Alchan—the ideal choice for engineering industry, exporters and paper coaters.

For further details contact:



**Alkyl Amines  
Chemicals Limited**

Vashi Office:

401-407, Nirman Vyapar Kendra, Plot No. 10,  
Sector-17, DBC, Vashi, New Bombay-400 705.  
Tel: 0215-682535/36. Tlx: 011-77138

**A trusted name in Chemicals.**

**Unichema  
International**

(UNILEVER GROUP)

West Germany Holland U.K./Australia/  
Malaysia.

**OFFERS**

**Glycerine C.P./U.S.P.**

(Min. 99.5% Pure)

**Nickel Catalyst**

(For Hydrogenation of Edible &  
Industrial Oils/Fatty Acids)

**Iso Propyl Palmitate**

**Iso Propyl Myristate**

**Dimer/Trimer Acids**

**Triacetin/Diacetin**

**Synthetic Substitutes of**

**-Sperm Oil**

**-Neats Foot Oil**

For Booking and Further Details Please Contact :  
Sole Agents in India :

**soofi  
enterprises**

1317, Dalamal Towers,

211, Nariman Point,

BOMBAY-400 021.

Telephone: 225559/224689 233074

Telex: 011-4187

Cable: SOOFICHEM

We also offer :

**PROPYLENE GLYCOL**

USP INDUSTRIAL EX-ARCO (USA ORIGIN)



For Your Requirements Of:

CHROMIC ACID  
POTASSIUM BICHROMATE  
SODIUM SULPHATE FINE & COARSE  
BASIC CHROME SULPHATE

SODIUM BICHROMATE  
SODIUM CHROMATE  
CHROME OXIDE GREEN

Manufactured By  
**GOLDEN CHEMICALS PVT. LTD.**

Please Contact:  
Distributors/Authorised Agents

**Crescent Petrochem Private Limited**

Reg. Office: 404, Faiz-E-Qutbi, 375, Narshi Natha Street, Bombay 400 009.  
Tel.: 348096/342231/341740  
Sales Office: 56-B, Sanjay Bldg., 5, Mittal Estate, Andheri-Kurla Road, Bombay 400 059.  
Tel.: 6322697/6329110/6322136

Telex: 011-5412 CRES IN

**AMMONIA** Gas  
**Liquor**

Purity-99.5%  
In Cylinders of 40 kg/50 kg.  
AND ALSO  
In Road Tankers  
Sp. Gravity 0.910 & 0.888.  
In Road Tankers, Drums &  
Carboys

Please Contact:

*Ji*

**JAYSONS CHEMICAL INDUSTRIES**

SAKI VIHAR LAKE ROAD, POST BOX NO. 8968, SAKINAKA, BOMBAY - 400 072

Phones: 582704/589205/589208

261, Kandla Kashan Street,  
Delhi-110 006  
Phone: 235516  
Gram: 'JAYCI'

**BRANCHES**

Plot No. 317/7, G.I.D.C.,  
Vapi, Dist. Bulsar-396 195  
Phone: 1689

Grams: JAYSONS--Bombay-400 072

18-A, Mai Krupa Society,  
Old Channai Highway Road,  
Baroda  
Phone: 22161

For Your Requirements Of:

COBALT CARBONATE  
COBALT ACETATE  
COBALT SULFATE  
COBALT NITRATE  
COPPER CARBONATE  
COPPER ACETATE  
NICKEL NITRATE  
NICKEL CARBONATE

NICKEL AMMONIUM SULPHATE  
NICKEL SULPHAMATE SOLUTION  
ZINC SULPHATE (PURE)  
ZINC SULPHATE MONO HYDRATE (PURE)  
ZINC CARBONATE  
ZINC ACETATE  
MANGANESE ACETATE  
POTASSIUM BROMIDE

Contact Manufacturers:

**M/s. EASTMEN CHEMICALS**

Office

310/3, Jawahar Nagar, Road No. 16,  
Goregaon (West), BOMBAY 400 062.  
Tel: 6724940

Factory:

Bafna Compound, Veoor,  
Palghar, Dist. THANA.  
Tel: 298



FOR YOUR BULK/DRUM REQUIREMENTS OF BEST QUALITY

# PETROLEUM ETHER

(40°-60°, 60°-80°, 80°-100°, 100°-120° or any other range  
to suit your requirements.

## ETHYL ACETATE

(ISI Grade)

## n-BUTYL ACETATE

(ISI Grade)

Contact Manufacturer:

### M/s. PAINTEX CHEMICAL CORPORATION

Regd. Office: 5, Buildwell House, 3rd Floor, Linking Road, Santacruz (W), Bombay 400 054.

Phones: 546805, 535025, 6496085, 6363392

Factory: Plot No. 52, Sector-2, Vasai Taluka Industrial Co-op. Estate, Ghavrai Pada,  
Vasai Road (E), Dist. Thane.

Phone: 232 (Waliv Exchange, V/a: VASAI)

## METTUR CHEMICALS OFFER

### HYDROBROMIC ACID

ANALAR AND TECHNICAL GRADES  
PACKED IN 35 KG NETT CARBOYS.

### LIQUID BROMINE

PACKED IN 3.5 KG NETT BOTTLES,  
SAFELY CRATED.

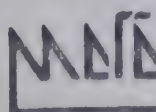
### PYRIDINE HYDROBROMIDE

MINIMUM ASSAY 97% w/w. SUITABLE  
FOR PHARMACEUTICAL APPLICATIONS.

With over 50 years of pioneering experience in basic Inorganic and Organic Chemicals, MCIC is diversifying into Bromides. Having own production of the basic raw material Bromine, MCIC is well-equipped to offer a wide range of Bromides round-the-year.

Other Bromides in our manufacturing range include Potassium Bromide, Ammonium Bromide, Calcium Bromide, Sodium Bromide etc

FOR ENQUIRIES, PLEASE CONTACT



THE METTUR CHEMICAL AND  
INDUSTRIAL CORPORATION LIMITED  
75 CATHEDRAL ROAD MADRAS 600 085  
PHONE 476504 TELEX 41-7305



For Your Small & Bulk Requirements Of:

Morpholine \* Phosphorous Trichloride  
Phosphorous pentoxide \* Phosphorous Oxychloride  
Mono Ethanolamine \* Tri Ethanolamine \* Diethanolamine



PLEASE CONTACT:

**S.I. CHEMICALS & TRADING CO. PVT. LTD.**

65, Bombay Samachar Marg, Sonawala Building, 2nd Floor, Bombay - 400 023  
Phone: 286 34 18, 286 12 36. Cable "SICORP080M" Telex: 11-5028 CHEM - IN

For most competitive quotation, best quality, prompt delivery  
and after-sales service for following items

EUGENOL  
CLOVE OIL (Rectified)  
CLOVE OIL (Pharma Grade)

CINNAMON OIL  
LEMON OIL  
ORANGE OIL

**FOLDED OILS**

Please Contact Manufacturers:

**CHEMICAL PROCESS CONSULTANTS**

Unit 202, Adarsh Ind. Estate, Sahar Road, Chakala, Andheri (East),  
BOMBAY - 400 099

Tel: 632 5855

Gram: KEMIPROSS

AVAILABLE AT MOST COMPETITIVE RATES

**ACID SLURRY**

SOFT AND HARD ANY QUANTITY



**KRIPA CHEMICALS PVT. LTD.**

**Admn. Office:**

8/9/10, 'Royal Chambers',  
S.No.47 Paud Rd., PUNE-411 038  
Phone: 433245

**Branch Office:**

House No. 1024, 10th Main Road,  
West of Chord Road,  
IIIrd Stage, 1st Block, BANGALORE-560 079



EVERY YEAR  
WE RESERVE ONE  
SPECIAL DAY FOR  
THANKSGIVING

2ND SEPTEMBER IS  
THE AUSPICIOUS DAY OF  
ESTABLISHMENT IN 1953  
AND AS WE COMPLETE  
THIRTY FIVE  
SPECTACULAR YEARS  
WE CELEBRATE OUR MOST  
PRECIOUS POSSESSION

YOUR GLITTERING TRUST IN  
OUR ORGANISATION.

Internationally Accredited  
Indian Agency House

**AMPI AGENCIES PRIVATE LIMITED**  
Successors to

**MORLIDHAR PREMCHAND & CO.**  
BOMBAY / NEW DELHI / CALCUTTA

*Liaison Offices:*  
BANGALORE, HYDERABAD, MADRAS,  
LUCKNOW

**WE OFFER**

PHENOL, ORTHO CRESOL,  
XYLENOL, MULTIVALENT PHENOL  
META-PARA CRESOL  
(N.L.C.).

\*

HYDRO SULPHITE OF SODA  
(T.C.P.L.)

\*

TITANIUM DIOXIDE  
(T.T.P. LTD.)

\*

FORMIC ACID/SODIUM SULPHATE  
(PERIYAR CHEMICALS)

\*

PHTHALIC ANHYDRIDE  
(THIRUMALAI)

\*

PHOSPHORIC ACID  
(STAR CHEMICALS)

\*

PALEGAL S.F.  
(BASF)

\*

HYDROQUINONE  
(ADITYA)

\*

GLYCERINE  
(KARNATAKA SOAPS & DETERGENTS LTD)

\*

SODA ASH  
(TAC)

*also available*

TRICHLORO ETHYLENE, N-BUTANOL, MIBK,  
ACETONE, IPA, PVP K-30, RANGOLITE, PHENOL  
LIQUID, ISOBUTANOL, TITANIUM (Rutile),  
CAUSTIC SODA FLAKES, MEG,  
SODIUM FORMATE PENTAERYTHRITOL,  
SEDIPURE TF2, ACETIC ACID  
and other industrial solvents, acids, pigments, etc.

Please Contact:

**RAMNIKLAL S. GOSALIA**

Admn. Office:

308/310, Parshva Chambers, 17/21, Issaji Street,  
Vadgadi, Bombay - 400 003.

Telephone: 327314, 327324, 345505

Cable: NEWLUCKY; Telex: 11-76882 RSG IN

*Associates:*

Shagoya Pvt. Ltd. \* Gosalia Brothers \* Yojit Enterprise  
United Enterprise \* General Trades Corporation



**Acetic Anhydride**

**Acetic Acid**

**Ethyl Acetate**

**Aspirin I. P.**

**Salicylic Acid I. P.**



**SHREE ENTERPRISES**  
(CHEMICALS) PVT. LTD.

A Shree Group

801, Dalamal Towers, 211, Nariman Point, BOMBAY-400 021.  
PHONES: 231336 □ 231308 GRAM: "ANHYDRIDE" TELEX: 011-5179



# CHEMICAL WEEKLY

VOL. XXXIII

AUGUST 30, 1988

No. 51

## Antartica -- The Continent under Siege?

Antartica has remained an object of scientific curiosity for centuries. Its vastness, geophysical isolation and climatic peculiarities offer unique opportunities in the pursuit of science. An exclusive natural phenomenon of ice cover differentiates Antartica from other continents. Practically, the entire area is covered by a massive ice sheet of more than 2000 meters in thickness. The close relationship between this titanic glacier, the atmosphere, the ocean and the continental thrust as well as the proven existence of large mineral wealth make Antartica an area of great future hope.

Antartica has been described as a pulsating continent and also a white cold desert. It is best described as a treeless, riverless, almost lifeless desert, windiest and highest continent which is the home of blizzards and the penguins.

India's Antartica research activities commenced in 1981, with the launching of first scientific expedition during 1981-82. The objective of the Indian Antartica programme has been to foster and promote scientific studies. India is the only developing Asian country to have established a permanent station in Antartica. China has set up its station in 1984-85 and acquired consultative status in October 1985 along with Uruguay.

Till now seven annual expeditions have been successfully launched from India. The latest and Seventh Indian expedition to Antartica operating from the permanent Indian Station Dakshin Gangotri had set for itself lofty and specific goals.

During the Sixth expedition, the geological survey had undertaken the survey of a mountain range (Petermann Mastiff), which revealed interesting mineralisation and deposits of ilmenite cores with a purity of 93%. During the seventh expedition, the survey work has been extended to another 1000 sq. km. of the range.

Another objective was the extension of geophysical investigations to adjacent areas and to collect samples for a study of the geothermal, geochronological and paleomagnetic properties.

In the field of geomagnetism, investigations were continued on the physics of magnetospheric storms in Antartica. One

Indian scientist walked through the winter last year to obtain continuous data for the Gangotri area. Besides continuing these observations, the Seventh expedition monitored optical, atmospheric high energy cosmic ray emissions.

Oceanography, naturally enough, claimed major attention. Exploration of the distribution, availability, variability of living organisms -- particularly krill, squid and fish claimed top priority. Biomass of krill, its growth rate, distribution pattern, migration and ecology came in for close scrutiny. Physical and chemical characteristics of the Antartica ocean by themselves offer a vast scope for intensive study.

During the Sixth expedition a major initiative had been taken in the study of blue green algae, existing in the ice free area of specific mountain range for e.g. Shirmacher and Wohltaub. Preliminary investigations revealed that about 80% of the samples collected were "no-fixing" blue green algae. The Seventh expedition, apart from further pursuing these studies explored the mechanism of the release of fixed nitrogen in the immediate surroundings. This will help to examine the influence on the growth of non-nitrogen fixing bacteria. An underwater survey of Priyadarshni lake (MAITRI) revealed the presence of thick algal mat consisting mainly of unicellular chlorophytes. The investigations are likely to unravel the interrelationship of blue green algae and other living forms thereby unravelling one of the fundamental mysteries of nature.

Studies on evolution, coal acclimatisation mechanism, physiology of energy fluxes, food chain dynamics and biomass production in glacial, limnetic oasis and littoral ecosystems of Antartica will all come in for intensive probe.

The Antartica polar climate is the most rigorous in the world; factors of diverse order contribute to it emphasising the features of uncertainty, cold and extreme dryness. Low temperature caused by the frequent high winds interacting with the ice sheet create the most inhospitable landscape that one could possibly imagine. The vagaries of the Antartica climate are still a challenge to the weathermen.

The dramatic depletion of ozone layer in Antartica reported in 1985 has aroused intense concern regarding the future con-



sequence to the global environment. A permanent geomagnetic laboratory has been set up at Dakshin Gangotri for conducting year-round studies, which include continuous monitoring of magnetic fields fluctuations. Five ozone sonde ascents were successfully taken during January-February 1987, besides the continuous recording of surface ozone content.

The Seventh expedition initiated the construction of a new station with associated series. The installation of these permanent facilities have given a fillip to the utilization of wind and solar energy.

A twelve bladed horizontal axis wind generator was assembled and commissioned and the performance evaluated in the vicinity of the MAITRI field camp in Antarctica. Testing was done from 26th January 1987 to February 1987. A maximum output of about 1.5 Kw at a wind speed of 28 knots from the south-east direction was recorded.

Two solar photovoltaic models in series were installed on the north facing roof top of the MAITRI camp with connections for the battery bank for charging. The two solar photovoltaic models left behind at Dakshin Gangotri station were monitored. The installation was found to be quite intact and the performance of the module satisfactory.

The sun shines as much on Antarctica as it does on the equator. Yet for four months each year, there is perpetual darkness. In Antarctica the ecosystem is so fragile, it can take 10 years for a footprint in the moss to disappear.

By all means, Antarctica called a 'Super Continent' by Dr. Arun Paulekar who led the largest Indian expedition, is a treasure trove of limitless natural resources. Seas surrounding Antarctica teem with biological bounty particularly dominated by krill, a shrimp like crustacean rich in protein. As researchers see it, krill has the potential to become one of the world's major fisheries. It is estimated that about 40-50 million tonnes of krill can be harvested from Antarctica seas.

Further, it is expected that about 50 mineral deposits can be located in the ice free area of the continent. In 1985, the German research vessel 'Polar Stern' found "unambiguous evidence of active petroleum sources" near the northern tip of Antarctica. And the USA on its part has estimated that offshore oil reserves of Antarctica must run into tens of billions of barrels.

Researchers are also confident of unearthing unlimited quantities of coal from beneath the icy crust of Antarctica. What's more, Antarctica's ice cap contains 70% of the world store of fresh water, pointing out to the possibility of towing iceberg to produce fresh water in dry areas.

The immediate threat to Antarctica's ecosystem stems from the intensive krill fishing resorted to by countries like the USSR and Japan. Since krill supports all the higher species in the marine food chain of Antarctica, depletion of krill stock is fraught with perilous consequences for the marine organisms of the continent. Krill is the major food source of five whale species,

three species of seal and 23 species of fish and squid and many birds.

Continuous krill fishing can disturb the eco-conditions region and many species here are highly vulnerable to conditions different from those in which they have been evolved. Ecologists are worried that disappearance of krill can spell disaster for a variety of bird and fish species in the region. And the vast, undisturbed wildlife reserve that Antarctica is, can become a graveyard of many rare marine organisms.

Another possible danger to the eco-stability of Antarctica comes from the possibility of industrially advanced nations taking to oil drilling in the region. For since more than a decade now, offshore seismic surveys have been carried out by Norway, West Germany, the Soviet Union, France, Australia, Japan and the United States. The severe cold, strong winds and moving ice-burys can lead to accidents of massive magnitude during the drilling.

Moreover, oil spills can harm the extensive breeding colonies of penguins and seals and even affect the polar ice caps exerting a disturbing impact on the global climate and sea level.

Antarctica is crucial to sustaining the biological productivity in the Indian Ocean, besides maintaining the global sea level and overall climate the world over. Air circulation pattern, temperature fluctuations and solar radiation in other parts of the world is directly affected by the rate of snow melting in Antarctica. Antarctica thus serves as a great natural lab, containing a wealth of information about the planet earth.

Interestingly the ice crust of Antarctica can provide a point to the level of chemical pollution affecting the world in toto. Researchers in Antarctica have been able to acquire an insight into the global levels of DDT pollution and the way it is transported from the analysis of the ice sheets of Antarctica. Similarly, Antarctica provides a special situation for monitoring the changes in the global atmosphere, triggered off by the fluctuations in carbon dioxide level. Further, the clarity of Antarctica's atmosphere has been of considerable significance in studying the extent of ozone depletion. As it is, ozone layer serves as a protective shield of earth by shutting off the entry of dangerous ultra violet rays. Research done from Antarctica has indicated a dramatic fall in the global ozone layer due to increased chemical pollution. Today this coldest and windiest continent, mostly bereft of life, is under siege.

Fired with greed for space and resources, man is leaving no stone unturned to exploit the vast treasure trove of resources hidden beneath the icy crust of Antarctica. Not content with laying waste the inhabitable part of the globe, man is now all set to pollute the pristine pure environment of Antarctica in the name of scientific exploration.

Certainly, it is high time Antarctica is freed from too much of human interference to maintain its vital importance to the rest of the world as a natural laboratory par excellence.

-- T.P.S. RAJAN



# CHEMARENA

L. VENKITESWARAN

## Antimalarials

*Artemisa annua* also known as *qinghao*, is a herb used in China for over 2000 years to combat malarial fever. Research on its active constituents has been going on in some countries including India but US has gone ahead and developed a derivative which is claimed to be more effective. Clinical trials are under way. Chinese researchers had isolated the active principle -- artemisin or Qinghaosu QHS which is a novel sesquiterpene lactone with a peroxy group. Catalytic hydrogenation has given an epoxide without antimalarial activity but when reduced with borohydride the lactone group becomes a lactol termed dihydro artemisinin-QHS which is more active. The WHO has taken interest in the work and in 1985 the ethyl ether of DQHS has been developed and the alpha and beta forms separated.

The  $\beta$ -ether called "artether" is being promoted for treatment of high risk cases including cerebral malaria.

Malaria is the Number One infectious disease with about 210 million cases per year by the *plasmodium falciparum*. The control of mosquitoes has not been effective over a long period due to resistance development to drugs and no effective vaccine yet in sight. The view is that malaria will need a variety of drug types to supplement the present chloroquine, mefloquine and pyrazinamide and the new artether may be a good addition. But costs of treatment are not yet clear and this artether requires to be injected into a large muscle. It is to be hoped that the ongoing work in India will lead to better alternatives.

## Homeopathy Creates a Sensation

Ambrose Bierce called homeopathy the humorist of the medical profession and the centenary of the founder Hahneman was celebrated recently. Homeopathy has continued to be practised extensively and claims thousands of adherents who swear by the sugar-coated pills which are said to contain micro or ultra-micro quantities of active remedial salts. Now that molecular biology has reached great heights and the action of biochemicals at the molecular level are analysed and explained, one could perhaps explain the effects and way of action of the ultra-micro dosage of some of the homeopathic remedies. But it is now reported that even a molecule of active ingredient is not required and that water retains an "image or memory" of the absent medicament molecule and be effective. What is more, this claim which is irrational and unbelievable is published in the most authoritative and prestigious science journal, *Nature* of London, even if *Lancet* would not have looked at it.

The sensational research paper is by Jacques Benveniste of France's National Institute of Health and Medical Research (INSERM) and a dozen co-workers there and in Israel, Italy and Canada -- an international effort. The group used a simple test that detects whether a certain type of white blood cell has been simulated by an

antibody to the cell's surface protein. When stimulated, the cell can no longer be stained and visualised under the microscope. It was found that antibody concentration of  $10^{-120}$  Mole and even lower could evoke this biological response. But if you compute the number of molecules present there can be only one at  $10^{-14}$  M dilution and the antibody cannot even be detected at  $10^{-9}$  M level. The effect was seen only in agitated "solution" of this dilution of a non-existent molecule. Heating, freezing or ultrasonification, suppressed the activity at this dilution but not of more concentrated ones. The speculation if not a conclusion is that of a molecular reorganisation of water. The findings were first reported to the paper two years back and the incredulous referees got repetitions done in five other laboratories around the world. The research work has leaked out to the press and excited the homeopaths who claim extremely small doses of certain drugs effect cures but *Nature's* editor suggests "wait and see" attitude before the belief in non-existent drug molecules.

The antibody has obviously retained its biological effect even in such dilutions at which no molecule could be present and perhaps it left an imprint on the water to take over. The results strike at the roots of two cen-



turies of observation and rationalisation of physical phenomena. "Nature" hopes that its readers may think of explanations of this result. We talk of a fifth sense or sixth sense and telepathy and the effects of planets from

millions of miles across totally empty space. Can we expect some similar work with air instead of water to show the remarkable behaviour of non-existent stimulant molecules or unseen hands in action.

## Algae for Motor Fuels

Department of Energy's Solar Energy Research Institute (SERI) at Golden, Colorado, USA claims to have developed cultures of microalgae and their conversion to liquid fuels. Work on this subject has continued in spite of serious cuts in the grants and has now reached a positive phase. Microalgae are single celled primitive plant types of 1 to 200 micrometers but they double their mass 3 to 5 times in a day. In ponds under proper conditions 12.5 kgm. can be produced per square meter per year and they can be cultivated in saline water as well. More important is that the cells can hold 70% of their mass as lipids which can be converted to diesel and motor fuels. The research work has screened over 3000 strains and selected 10 to 25 strains. *Chaetoceros* and *Navicula* strains showed most promise, tolerating temperatures of 10 to 35°C and salinity of 10 to 85 millimhos/cu.m. Growth rates of 35 gm/m/day have been achieved with 66% content of lipids in laboratory and 40% outdoors. It is said that after a growth phase the cells are transferred to a second medium where reduced

nitrogen and silica leads to lipid accumulation. The lipids are triglycerides as well as phospho and glycolipids and some hydrocarbons are also formed. The next step would be to genetically alter the selected strains for higher growth rates. For scale-up, an open pond system is being constructed in an area where 5000 kcal/m<sup>2</sup> of daylight is available. The pond is of earthen lined with clay and crushed rock into a liner of chlorinated polyethylene. The scale up is being undertaken by Microbial products of Fairfield, Calif. The problem of carbon dioxide supply has to be tackled and then the harvesting which accounts for 25% of the cost. Suitable flocculants comprising cationic polymers are useful.

The lipids contain 10% oxygen which needs to be removed to get the useful hydrocarbon fuels and zeolite catalysts are said to be promising. But commercial success is some way off from the speculation of microalgae supplying 150 to 400 bbl of liquid fuel per acre per year at perhaps \$ 1.60 to 2.00 per US gallon.

## Hydrogen Peroxide

We had referred (See *CHEMICAL WEEKLY*, June 21, 1988, p. 35) earlier to the new process developed by Du Pont of USA for making hydrogen peroxide directly from hydrogen and oxygen. The Patent 4,681,751 granted for this process gives some details though rather limited. The most attractive features and claims are the absence of any organic component and therefore no risks of explosion and the much higher content of hydrogen peroxide in the reacted solution with reduced costs of recovery. The catalyst is palladium on adsorbent carbon which is prepared by contacting the powdered carbon at room temperature for five minutes with a solution prepared from 1 mgm. of PdCl<sub>2</sub> per gm. of 0.1 N HCl at a ratio of 6 mgm. carbon per gm of solution. The Pd content is preferably above 0.5%. The ratio of Pd-carbon at 2% gives the best results. Adsorbent carbon grades like Alfa USP, Supelco, Carbosieve and others are suitable. The carbon can be prepared from sugars and cellulose in nitrogen by stages to 900-1000°C and activation afterwards. The process is carried out preferably at 0 to 25°C or lower if necessary. Pressures of 500 to 2500 psig. are preferred and higher

pressures yield higher concentration of product. Best results were at 400 psig. and inlet ratio of O<sub>2</sub>/H<sub>2</sub> at 1:1. Continuous operation is contemplated (and perhaps carried out by now) at 1000 psig. with 50 psig. of H<sub>2</sub> and 950 psig. of oxygen partial pressure, about 1 mgm. of 5% Pd/c per gm. of reaction mix, about 0.5 m phosphoric acid and -10 to +25°C with vigorous liquid-gases contact.

In batch tests the aqueous acid/halide solution was prepared by dissolving 0.103 gm. of NaBr and 4.90 gm. of H<sub>2</sub>SO<sub>4</sub> in a litre of water and dilution to 2 litres. The reaction mix was prepared from 150 gm. of commercial (Alfa) 5% Pd/c and 35 ml. of the above acid/halide solution. The reaction was carried out in an autoclave with a liner and outside cooling. The reaction mix was introduced after argon purge and stirred by impeller at 250 rpm. before introduction of the gas mix. About 15% solution of hydrogen peroxide was obtained. The details of recovery procedure are not given and these may be an important part of commercial know-how. It is expected that this new process could be of importance for the future.



FOR COMPETITIVE IMPORTS OF CHEMICALS, PHARMACEUTICALS  
RAW MATERIALS AND PARTICULARLY FOR THE FOLLOWING ITEMS :

Pyridine 2 Deg.

Acrylonitrile

Acetonitrile

Cyanuric Chloride

Propylene Glycol USP/Industrial

Cyano Pyridine

Benzaldehyde



PLEASE CONTACT WITH YOUR SPECIFIC REQUIREMENTS

# CHEMET

**HEAD OFFICE :**

1a) Building, 1st Floor, P. B. No. 195  
210, Dr. D. N. Road, Bombay-400 001.

**CALCUTTA OFFICE :**

Sharma House, 3rd Floor,  
1/2, Lord Sinha Road, Calcutta 700 071.

**MADRAS OFFICE :**

10, Kondy Chetty Street, 1st Floor,  
P. B. No. 1709, Madras-600 001.

**DELHI OFFICE :**

214, Hans Bhavan, Wing No. 1,  
Bahadurshah Zafer Marg, New Delhi-110 002

H'bad Off: 11 Fir., 3-4-874/1/A/7, P.B. No. 1262 Barkatpura, Hyderabad-27. Ph: 60414

Phones : 2043803/4/5/6/7

Fax. No. 2048854

Cable : DEGUCHEM Bombay

Telex : 11 3229/11 4631 DGKM IN

Phones : 447306/446155

Cable : DEGUCHEM Calcutta

Telex : 21 3325 DGKN IN

Phones : 582447/587617

Cable : DEGUCHEM Madras

Telex : 41 7554 DGKM IN

Phones : 3311373/3319787/3319791

Cable : DEGUCHEM New Delhi

Telex : 31 65921 DGKM IN



## Benzene shortage hits chemicals exports

The chemical industry defaulted over Rs. 20 crores worth of export commitments in recent months because of non-availability of benzene, according to industry sources at Bombay.

Three Vapi-based units (Chemical Organics, Nascent Chemicals and Chemiesynth) with export orders to the tune of Rs. 40 to 50 lakhs a month have been starved of benzene for the last one-and-a-half months. Against a requirement of 500 tonnes per month, these units received only 30 tonnes during the last 45 days.

These and a host of other small-scale units also supply dye intermediates to large firms like Atul, Atic and Sandoz, which goes into finished export goods. The total loss would easily exceed Rs. 20 crores, according to industry estimates.

Small-scale units, who have been lifting benzene from the refineries for years, complain that the requirements of the two big LAB producers (Reliance Industries and Tamilnadu Petrochemicals) have taken precedence over theirs. Together the two LAB giants consume around 4,000 tonnes of benzene every month.

Ironically, the bulk of benzene is being diverted into this nonpriority industry, which is currently facing a glut. Refineries have expressed their inability to reduce supplies to LAB units because of contractual obligations.

"This is unfortunate because refineries had spurned our offers to enter into contracts in the past, because we are not big consumers," a small-scale manufacturer said. "When they entered into contracts with LAB units, they should have anticipated the current scarcity of the material," he said.

It is true that RIL and TPL have invested crores of rupees in their plants, he said. "But a 10 to 15 per cent cut in their supplies would not seriously affect them. It would have served our needs and helped fulfil our export commitments," a Gujarat-based manufacturer said.

At stake is not merely few crores of rupees worth exports but India's reputation as a reliable supplier. India is rated higher than China in fulfilling its

commitments. More significantly, this is the golden era of export of dyes and dye intermediates. China is no longer dumping goods and western countries are opting out what they regard as low-tech, polluting industry.

Plant shut downs and temporary shortages are part of the chemical industry scenario. What is worrying chemical units is the distribution policy which ensures priority supply to a few units at the cost of the many.

A case in point is concentrated nitric acid (CNA) another item in short supply. The major producer is Rashtriya Chemicals and Fertilizers (RCF), which produces around 1,500 tonnes a month. Out of this, as much as 900 tonnes is reserved for various priority sectors like Defence Ministry units (for the manufacture of explosives) and public sector units like Hindustan Organic Chemicals Ltd. (HOC) and Indian Petrochemicals Corporation Ltd. (IPCL). "This is okay when the going is good but when there is a shortfall in production, the priority units gets the same amount and we are left in the lurch," a consumer lamented.

HOC, he said, produces about 1,800 tonnes of CNA a month and gets 200 tonnes from RCF of priority basis, which is only ten per cent of its total requirement. Diversion of these 200 tonnes to chemical units could save lakhs of rupees worth of exports without crippling HOC, he pointed out.

(See also p. 44)

### HIGHER PRICE WON'T HIT DMT SALE: WADIA

Bombay Dyeing does not visualise any problems in marketing its DMT at the revised higher price of Rs. 27,000 per tonne as compared to Rs. 21,000, prevailing till recently.

Company chairman Nusli Wadia, while presiding over the annual general meeting of the company, at Bombay on 22nd August, stated: "Our DMT is only Rs. 500 per tonne higher than the PTA price and there is no problem of selling the material. Rather we are booked till the end of the current financial year."

The company is going ahead with the expansion of its DMT plant from

60,000 to one lakh tonnes and has already signed an agreement with Hoechst Troisdorf for technical collaboration. The expansion would be complete within two years of receiving government approval for the foreign collaboration. "This Rs. 75-crore expansion would be financed through internal sources and foreign exchange loans," Mr. Wadia added. The new technology will also help in reducing raw material and energy consumption in the existing DMT plant also, it was stated.

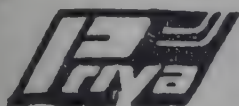
During the first four months of the current financial year (April-July) DMT production was 9 per cent higher at 21,264 tonnes as compared with 19,575 tonnes for the corresponding period last year. Sales were up by 13 per cent at Rs 45.92 crores, compared to Rs. 43.81 crores during the same period.

The company's total turnover during the first four months of the current year was Rs 110.25 crores, recording a 13 per cent increase over Rs 97.73 crores for the corresponding period last year. The production in the textile division was up by only 6 per cent during the same period, while sales were higher by 19 per cent at Rs 64.33 crores, against Rs 53.92 crores for the corresponding period last year.

The profit margin in the DMT division during first five months of the current year has been squeezed due to higher paraxylene cost. However, the "profitability has been restored to prebudget levels with the hike of Rs 6,000 per tonne in DMT's selling price," Mr Wadia said. "This would bring in additional revenue of around Rs 3 crores per month, and thus the next 7 months are expected to be as good as last year," he added.

Bombay Dyeing is the biggest loser due to the hike in import duty on paraxylene, as all other DMT/PTA manufacturers have their captive plants for the manufacture of paraxylene, Mr Wadia said. The company had applied as early as 1989 to be allowed to manufacture paraxylene. However, it was informed that "it is reserved for the public sector and that Bharat Petroleum at Trombay would manufacture it. The proposal for this is still under consideration after 8 years have passed," he added. (See p. 56 for earlier news)





*For your import requirements of:*

Isobutanol

n-Butanol

n-Propanol

Melamine

# PRIYA CHEMICALS

**HEAD OFFICE :**

Podar Chambers, 4th Floor  
S. A. Brelvi Street,  
Bombay-400 001.

Phone : 2860596-2863811-2863878  
2863783-2863900

Telex : 011-5495 PRIA-IN  
011-2472 PODR-IN

**BRANCHES : HYDERABAD OFFICE :**

Prashanthi Commercial Complex, 8-9-30/8 to 8/8  
1st Floor, Basheerbagh, Hyderabad-500 029

Phone : 236068

**DELHI OFFICE :**

Flat No. 8, 10th Floor, Akash Deep Bldg.  
Barakhamba Road, New Delhi-110 001.

Phone : 3314512  
3310413

**BANGALORE OFFICE :**

Devatha Plaza, 131/132, Residency Road,  
Bangalore-560 025.

Phone : 564027

**MADRAS OFFICE :**

No. 5, Manikeswari, Kilpauk, Madras-600 010

Phone : 663632

**CALCUTTA OFFICE :**

8, Lyons Range, Calcutta-700 001

202571  
Phone : 209853



## Inputs shortage cripple auxiliary industry

Severe shortage of important raw materials like ethylene oxide, butyl acrylate etc. have brought the Indian Chemicals Auxiliary Industries to a standstill. Frequent shut down by the two manufacturers of ethylene oxide during the last eight months was the major reason for the crisis (vide CW dated 23rd August, 1988).

Addressing a Press Conference, Mr. S.K. Parekh, President of the Indian Chemicals Auxiliaries Manufacturers Association last week, said that the Association was planning to meet the Government authorities concerned to sort out the problem.

Ethylene Oxide (EO) is a vital raw material required by about 70 EO Condensate Manufacturers who supply their products to atleast 2000 units manufacturing surface active and other products. The number of employees involved in these activities are about 20,000.

EO is manufactured at present only by National Organic Chemical Industries Limited (NOCIL) in Bombay and a public sector company Indian Petrochemicals Corporation Limited (IPCL) in Baroda.

EO is reacted with various chemicals which give rise to end products like textile process chemicals, oil additives for petroleum drilling, emulsifiers for pesticide industries, solvents for defence products, dyes as well as it is one of the vital raw materials in manufacture of brake fluids, medicinal, edible, cosmetic and pharma products.

Mr. M. D. Dhamankar, a leading luminary of the auxiliary industry, was of the opinion in view of good monsoon, offtake of pesticides would increase. Hence it was very essential the regular availability of EO should be made certain. Pesticides industry is using a number of auxiliaries made out of EO.

The Government had estimated the demand for this product to be around 20,000 tons for 1988-89 and it was hoped that the two manufacturers namely IPCL and NOCIL will make the same available to the industries. However, in the months of November and December, NOCIL had to take a shut down and IPCL had to take a shut down in the month of May and June. This has meant that 16½% of production estimated was not available in the

form of EO from these two suppliers. This means that there has been non-availability of about 3,000 tons of EO between April 1988 to now.

There have been serious explosions in large petrochemical complexes in U.S.A. and other large manufacturing countries. This has made a terrific impact on availability of Ethylene based products all over the world. As a result of this, MEG (Mono Ethylene Glycol — A Derivative of EO) has gone in tremendous short supply and the International prices, as offered to Indian buyers, have gone up from USD 650 per ton to USD 1,750 per ton. Few months back, there were no buyers for MEG manufactured by IPCL and NOCIL and the Government had to intervene in pressuring consumers of MEG to purchase their requirements from IPCL and NOCIL.

EO consumers are afraid that due to temporary world situation and shortage of MEG, the manufacturers of EO in India may divert their production of EO for making MEG, instead of supplying EO to consumers mentioned above. EO consumers make products which are a vital raw material for :

- (a) Textile Exports which is today having a boom in the International Market and in case this industry is not supplied with EO Condensates, exports will be adversely affected.
- (b) EO Condensates are used on a large scale in the manufacture of new quality of brake fluids which is safer than the earlier formulations and is on the line of the latest international standard for the same. One of the base materials was imported but now import substitution has been made on the hope of EO availability. If however shortage of EO continues it will bring an adverse effect in the success of import substitution.
- (c) EO is a hazardous chemical with a very low flash point and is not fit for importing and therefore the manufacturers have to depend only on local availability of EO. Therefore, though EO is under OGL Policy of the Government, the same cannot be imported in actual practice. MEG is non hazardous and can be imported.

ted. MEG is also a large consumption item and even if part the ethylene oxide is diverted to MEG, it will not make a sizeable difference to the consumers of MEG whereas the effect of the conversion will be a very serious problem for EO consumers and more than 20,000 employees will face a threat of losing jobs. EO consumers are a majority small scale industry and the Government has invested a substantial fund amongst these groups of small scale industries. As it there are tremendous problems to small scale industries and non-availability of EO will mean Death Knell to these small scale industries.

- (d) EO is a vital raw material amongst the manufacturers of Ethylene oxide Condensates, Ethanolamines, Glycol Ethers, Dy Intermediates and Leather Chemicals which are either import substitutes or thrust areas in the export policies of our country.

The interest of EO consumers are limited in requesting the manufacturers of EO to maintain levels of production to meet industries demand of about 20,000 tons of EO and only the excess availability of EO above this 20,000 tons be converted into MEG, as the EO manufacturers are using normal availability period as the reference period for allocation of EO to actual users, they should follow a similar rule on MEG.

### EXPORT OF LAB ALLOWED

The Union government has, for the first time, decided to allow the export of linear alkyl benzene (LAB). According to information available in New Delhi, initial exports would come to about 50,000 tonnes valued at \$40 million.

A decision to this effect was taken recently at a meeting which the secretary, petrochemicals, Mr. H. K. Khan, took with the producers' representatives. The immediate markets that have been identified include China, Thailand, Singapore and Malaysia, Europe, also appears to be extremely promising in view of the competitive prices.

Of the 50,000 tonnes, the Tamil Nadu Petro-products and Reliance Ltd. will account for exports of 20,000 tonnes each. The balance will be exported by IPCL.



## Butyl acrylate and 2 ethyl hexyl acrylate

Butyl Acrylate is a vital input for the manufacture of Synthetic Resins (Acrylic Resins) which are used by the textile and leather industries in the manufacture of goods largely exported. Butyl Acrylate is required by about 100 Synthetic Resin manufacturers which include about 90 small scale units and 10 medium/DGTD Units who supply their products to various textile and leather industries. The number of employees involved in the manufacture of Synthetic Resins (Acrylic Resins) are about 25,000. Butyl Acrylate is not being produced in adequate quantities by the indigenous producers to meet the requirements of the cosmetic market which is 2300-2500 t.p.a. Yet it continues to be in App. 3 Part A of the current import policy and consequently very meagre imports can be made to supplement the small supplies produced domestically.

The principal manufacturer IPCL, whose plant has been primarily installed to manufacture methyl acrylate required for their captive consumption, states that their plant capacity for all acrylates is 10,000 tpa. Going by past performance it would appear that IPCL's plant capacity is in effect less as only one acrylate is being produced at a time. Also the actual capacity depends on the product mix because the process time cycle differs for each product. Further, their acrylate plant has been having technical problems which has cut into the operating capacity of the plant.

IPCL Bombay, claim to have a capacity of 3000 t.p.a. to manufacture acrylates but in actual practice they manufacture more of ethyl acrylate and negligible quantities of Butyl Acrylate have been offered infrequently to actual users.

At present the fate of another acrylic monomer namely 2 Ethyl Hexyl Acrylate is similar to Butyl Acrylate. Both the manufacturers are not supplying 2 Ethyl Hexyl Acrylate to various small sector industrial units who manufacture Synthetic Resin Adhesives. Apart from this due to explosion in the plant of a big U.S.A. manufacturer the supply position of Acrylic Monomers has become very difficult. In fact it has become a rare commodity in the foreign countries and the

### DGTD TURNS DOWN EO USERS' PLEA

The Director-General of Technical Development has declined ethylene oxide (EO) consumers' plea that Indian Petrochemicals Corporation Ltd. be directed not to divert more EO for producing monethylene glycol (MEG). The DGTD official reportedly said that MEG was also an important raw material and his office did not want to interfere with the product mix decided upon by the company.

At a meeting held in Delhi recently a leading EO consumer said that according to his information, IPCL has decided to market only 550 tonnes of EO per month, against a capacity of 750 to 800 tonnes. IPCL proposed to convert the remaining EO into MEG, he said.

He wanted DGTD to advise IPCL to maintain its MEG output at the 1986

No IPCL representative was present at the meeting. A representative of National Organic Chemical Industries Ltd. (NOCIL), the only other EO manufacturer, said his company could produce a maximum of 850 tonnes a month. The company would continue to sell this quantity on the basis of each company's offtake in 1986-87, he said.

price quoted is totally unworkable. The Government therefore should exercise their authority to the producers of Acrylic Monomers to produce more quantities and supply the goods in sufficient quantities to all the consumers. IPCL could produce the entire requirement of Butyl Acrylate and 2 Ethyl

Hexyl Acrylate without any problem if they are forced to manufacture.

If immediate action is not taken by the Government consumers of Butyl Acrylate and 2 Ethyl Hexyl Acrylate shall have no alternative but to close their units which will ultimately affect 25,000 employees.

FOR THE MOST COMPETITIVE CIF PRICE OF

## DIETHYL SULPHATE

Please Contact :

MR. DHAIRESH K. SANGHVI

**M/s. Kantilal Sanghvi & Co.**

Union Co-operative Insurance Bldg.,

23, Sir Pheroza Shah Mehta Road,

BOMBAY-400 001.

Phone (Office): 2870836/2873217/2873628/2874153

(Resi.) : 4226850/4229086

Telex : 11 5725 EXIM IN — 11 3356 EXIM IN

Gram : EXPIM, Bombay



Dr. O. P. KHARBANDA

# Frankly Speaking

O. P. KHARBANDA, Cost & Management Consultant,  
501, Olympus, Altamount Road, Bombay-400 026.

## A Damn Good Investment !

Nearly thirty years ago, I entered a life subscription for the Readers Digest paying \$100, in the name of my son. Our entire family of four has read avidly the monthly issues of the Digest acclaimed to be the 'World's most read magazine'. In order to locate a particular article of interest that appeared 'just the other month' (it always turned out to be much older than we thought) we used to 'browse through' (quite profitably) the entire collection. Later, we came to know of the annual index which was available, free of charge, against a specific request. This facilitated the search process considerably, although the random browsing had its own value, including a nobel prize! (See next FRANKLY SPEAKING).

We moved house from Calcutta to Bombay in the early 60's and thereafter, we had to shift house four times. Each move was preceeded by 'spring cleaning with some hard decisions on whether to retain a particular item or not. In case of the Digest, the choice was clear and unanimous. It was always retained, with the result that until recently we had half a cupboard full of the back issues of the Digest. The collection was always easily accessible and it was a pleasure to pick up some old issues at random and find quite a bit of material very relevant at that particular time. As an author, before starting an article or a book on any particular subject in my field of Engineering-Finance-Management, I usually begin my search from the Digest Index and always find some relevant material as a starter/nucleus sufficient to get the project 'off the ground' and rounds to the various libraries, depending on the particular subject in hand, would enable collection of more material.

Earlier I had thought of getting the back volumes bound but they can be bulky for convenient hand-

ling. So, why not cut out articles of interest from the old issues of the Digest, including some of the regular features such as Life in These United States, It Pays to Enrich Your Word Power etc. The material is now classified subjectwise e.g., health, nature, history, geography, personalities etc. Browsing through a collection on one particular subject is like getting a quick 'refresher course' on the subject. This exercise has been most rewarding in generating new ideas for my future writings. And the real fun has only just begun!

Each of us has in every issue of the Digest several items of direct relevance to our respective fields. I am a Chemical Engineer and a consultant in the cost and management field. My wife, Sudershan, is a qualified teacher with particular interest in history and romance. Our daughter, Madhu, qualified in catering, Hotel Management and Applied Nutrition and used to manage a premier industrial canteen club. Her husband is also in the same field and is Manager (F & B) at the five star deluxe, Leela Penta. Our son, Vivek, by whose courtesy we get to read the Digest is a Chartered Accountant (Certified) and runs a Computer Centre in Bombay suburbs. Fortunately, his wife Smita is also fond of reading. There is another 'fallout' too, e.g., on my 2-3 weeks trips abroad or a shorter one in India, I take with me material on a couple of subjects for perusal.

The Digest has indeed proved to be one of our best investments, ever. It has been recovered many times over and with the technique described here, the return has increased several fold. The dividends, of course, still continue to come every month and we eagerly look forward to many more years of pleasure, in reading and education. And this 'treasure' will be bequeathed to our grand children, the first one having just started school!



FOR YOUR IMPORTS  
AT COMPETITIVE CIF PRICE  
FROM RELIABLE SOURCES

Propylene Glycol  
Pyridine Pure 2°  
Ethyl Glycol  
Sodium Formate  
Pentaerythritol  
Trimethylol Propane  
Tetra Bromo Bisphenol-A  
Dibromo Neopentyl Glycol  
Ethyl Bromide  
Piperazine Anhydrous  
Benzaldehyde  
2,4-Dichloro Toluene  
o-Chloro Toluene  
Cyclohexylamine  
Tetra Butyl Ammonium  
Bromide

Hydroquinone  
Dimethyl Amino Ethanol  
Methane Sulphonic Acid  
Methane Sulphonyl Chloride  
Epichlorohydrine  
Dicumyl Peroxide  
Dimethyl Sulphoxide  
Mercuryl Metal  
Zinc Oxide  
Maleic Anhydride  
Aniline Oil  
Cyclohexanone  
Butyl Cellosolve  
n-Propyl Bromide  
Isopropyl Bromide

Please contact for further details :



**S. AMIT & CO.**

A TRUSTED NAME FOR IMPORT OF YOUR CHEMICALS

105, Neelam Centre, "A" Wing, Hind Cycle Road,  
Worli, Bombay-400 025.

Phones : 4934627-28/4933310  
Cable : "DULICTOL"

Telex : 011-76877 CMIT IN  
FAX NO. 22-4949504

Madras Office : Queens Court, 134, Montieth Road, Madras-600 008.  
Phone : 860172/866942

Hyderabad Office: 8-3-215/7 (First Floor), Srinivasa Nagar Colony (West).  
HYDERABAD-500 890.  
Phone : 35110

Our Associates : M/s. CHEM AMIT



## Benzene shortage: HOC Cochin unit 'shut down'

Hindustan Organic Chemicals Ltd. has been forced to suspend operations at its 40,000 TPA phenol plant in Cochin, the first major casualty of the acute benzene shortage now plaguing the chemical industry.

The plant requires around 1000 tonnes of benzene everyday. To run the plant at 70 per cent capacity, benzene requirement is around 70 tonnes. The plant cannot run below this capacity, it is understood. The bulk of the supplies are effected by Bharat Petroleum Corporation Ltd. A BPCL spokesman said the Corporation has been endeavouring to fulfill its commitments to the best of its ability.

HOC is hopeful of resuming operations by the month-end, when some 17,000 tonnes of imports, under the advance licensing scheme, is expected to arrive. Benzene is now quoted around \$ 400-425 in the international market.

The virtual shut-down of the phenol plant was led to a scarcity of phenol. The worst affected is the plywood industry, the major consumer. Phenol prices, however, have not flared, industry sources said. HOC is the major producer, with 40,000 tonnes capacity, followed by Herdillia Chemicals with 20,000 tonnes.

The benzene shortage has also affected HOC's export commitments. The company has so far exported 3,000 tonnes of phenol and had planned to export 1,000 tonnes every month.

According to an industry source, the two lab units (Reliance Industries and Tamil Nadu Petroproducts Ltd), major benzene consumers, are relatively unaffected by the crisis. Both units are said to be holding around two months' inventory.

Unconfirmed reports say that the commissioning of Cochin Refineries' 87,000 TPA benzene plant, scheduled for early 1989, is likely to be delayed. Until this plant goes on stream, the industry will have to live with shortages, it is feared. The material is also said to be in short supply in the international market.

Industry sources say both Indian Oil Corporation and the State Trading Corporation are scouting for imports while

the Government has okayed. Only an year ago, there was a surplus of benzene. The dramatic rise in consumption is attributed mainly to the commissioning of the two lab units, who between them consume more than 50,000 tonnes of benzene.

Benzene is quoted around Rs. 6,500 per tonne ex-factory. The major producers are Indian Oil Corporation, whose 20-year old Koyali plant produces 48,000 TPA and Bharat Petroleum Corporation Ltd, whose three-year-old plant in Bombay has a capacity of 98,000 TPA.

Other producers include Indian Petrochemicals Corporation Ltd (IPCL) which produces 35,000 TPA, about half of which goes for captive consumption. National Organic Chemical Industries Ltd (NOCIL) produces around 15,000 TPA and the various other steel plant produce around 26,000 tonnes as a by-product.

### BENZENE BEING DIVERTED TO LAB UNITS

Many medium and small-scale units making dyes, dyes intermediates, pesticides and bulk drugs are totally denied of supplies of benzene, a building block for these industries, since last several weeks.

These medium and small-scale units have received virtually no supplies of benzene since this July. Many of these units had to drastically curtail their production and export plans.

Both Bharat Petroleum Corporation and Indian Oil Corporation, two large manufacturers of benzene, are reportedly diverting a substantial part of their production to manufacturers of linear alkyl benzene (LAB) and to other large users.

Almost 50 per cent of the current monthly production of 13,000 tonnes of benzene are consumed by the three LAB manufacturers.

Hindustan Organic Chemicals which uses benzene for the manufacture of dyes and dyes intermediates requires 2000 tonnes of benzene a month while Gujarat State Fertilizer Corporation requires 2000 tonnes of benzene for the manufacture of caprolactum.

Industry sources said the shrinkage in the availability of benzene has arisen especially after the commissioning of the LAB plants of Reliance Industries and Tamil Nadu Petrochemicals early this year.

Two LAB units and other large users of benzene have contractual arrangements with both the oil companies for regular supplies of benzene. But no such contracts have been executed between oil companies and most of the medium and small-scale units.

Meanwhile, the State Trading Corporation has been asked to import 14,000 tonnes of benzene in the context of the current tight supply situations. Out of this quantity 7,000 tonnes are expected to be imported very shortly.

### LAB STOCKS PILE UP

Linear alkyl benzene (LAB), a vital input for detergent manufacture has no takers now.

The three manufacturers of LAB Indian Petrochemicals Corporation Ltd, Reliance Industries and Tamil Nadu Petrochemicals have a combined unsold stock of over 35,000 tonnes valued at over Rs. 75 crores.

Only a few months ago, the State Trading Corporation had imported this chemical on a large-scale as the domestic production by IPCL then was inadequate to meet the total demand.

According to informed sources, the current monthly production of LAB by the three units is placed at 13,000 tonnes whereas the monthly demand from the detergent industry is not more than 10,000 tonnes.

With a monthly addition of at least 3,000 tonnes of LAB to the stocks with no substantial increase in demand, manufacturers may face a serious inventory problem in the months to come.

Nirma still ranks the largest user of LAB with a monthly consumption of 6,000 tonnes followed by Hindustan Lever at 2,000 tonnes.

Reliance has a capacity to produce 60,000 tonnes per annum, Tamil Nadu Petro 50,000 tonnes, and IPCL 30,000 tonnes.

The sources point out that with surplus production of LAB now and in the months to come, the government should encourage the export of LAB to avoid stock accumulation.

A major hitch for the export of LAB would be the high price as compared to the international price.



## ICMA proposals to boost chemicals export

The Indian Chemical Manufacturers Association (ICMA) has made certain commendations with a view to expanding the chemicals export base to Rs. 900 crores from the present Rs. 200 crores in line with Government objectives.

ICMA has suggested joint monitoring of the erratic raw materials supply position by the Government and industry and the initiation of corrective steps through a flexible adjustment in cash compensatory support or making available inputs at steady prices.

Further, it has recommended that items available adequately in the domestic market should not be shifted from appendix 2B from appendix 3A as this would affect manufacturers adversely. However, the association agrees to the need for an immediate policy review on the subject.

ICMA has also suggested the formation of a standing committee on

trade and tariff for a broad-based review of various sectoral representations made by different sectors of industry.

Speaking at a news conference in New Delhi recently the ICMA President, Mr. S.M. Datta, said chemicals export from India is suffering from three inherent drawbacks. The size of units are comparatively smaller than international limit, the cost of inputs tend to go higher and the cost of energy consumption works against the units.

ICMA has also listed several hindrances in the way of growth of the chemicals industry despite an average annual growth rate of 12 per cent during the last four years. Removal of these lacunae would facilitate an accelerated growth for the industry during the Eighth Plan period, according to the association.

In view of the recent liberalisation measures by the Government, ICMA

has suggested that liberalisation should cover both the ID and R Act and the MRTP Act without exception and should be extended to the chemicals, petrochemicals and pesticides industry so as to provide the necessary impetus for growth. So far, the Government had been issuing notices granting exemptions under the ID and R Act or the MRTP Act as measures of liberalisation, the association has said.

It has further suggested that locational constraints should also not be made applicable to capacity re-endorsement, automatic growth and broad-banding provisions. According to a recent clarification, the same is not applicable to units expanding to minimum economic size of operations.

Also broad-banding of chemicals should be extended to dyes and dyestuff intermediates and a dialogue should be initiated between DGTD and ICMA in this regard.

These apart, ICMA has suggested that industrial licences should make adequate provisions for chemicals by-products within broadly defined specifications.

### CIF OFFER FOR YOUR ACTUAL IMPORTS :

2 Hydroxy Propyl Acrylate

2 Methoxy Ethyl Acrylate

Cyclohexyl Acrylate

1,6-Hexanediol Di Acrylate

Trimethylol Propane Tri Acrylate

-Polyester Acrylate

-Urethane Acrylate

-Epoxy Acrylate

-2-Ethylhexyl-Thioglycolate

Dicyclohexyl-Phthalate

## **TI & M LIMITED**



GPO BOX 1308, BOMBAY-1  
PO BOX 7087, NEW DELHI-2  
PO BOX 9151, CALCUTTA-16  
PO BOX 1960, MADRAS-1

PH : 2870903/4, 2870492  
PH : 265658  
PH : 442595-9  
PH : 514261

TELEX : 11-6378-2216  
TELEX : 31-2319  
TELEX : 21-7359  
TELEX : 41-301



## Fertiliser order amended

The Union Government has amended the Fertiliser (Control) Order of 1985 by issuing a new order to be called the Fertiliser (Control) (Third Amendment) Order of 1988. The order brings under its purview micro-nutrient fertilisers.

The order has now redefined fertilisers, which now means any substance used or intended to be used as a fertiliser of the soil and or crop and specified in Part-A of Schedule-I of the order and includes a mixture of fertilisers, mixture of micro-nutrient fertilisers and special mixture of fertilisers.

According to the order, mixture of micro-nutrient fertilisers would mean a mixture of two or more micro-nutrient fertilisers. Similarly, "grade" under the order would mean the nutrient contents in the fertiliser expressed in percentage.

The order now stipulates that a State Government may by a notification in the official Gazette and on such terms and conditions as may be specified in such notifications, constitute a committee called the State fertiliser committee to advise it regarding the grades and

formulations of mixture of micro-nutrient fertilisers and their specifications.

Such committees would consist of a chairman and not more than five other members, having experience or knowledge in the field, including a representative from the State Agricultural University, the fertiliser industry and the Indian Micro-fertilisers Manufacturers' Association.

The amended order also stipulates that subject to other provisions, no person shall be allowed to manufacture any mixture of fertilisers unless such mixture conforms to the standards set out in the notification to be issued by the Union Government in the official Gazette.

Similarly, no person shall manufacture any mixture of micro-nutrient fertilisers unless such mixture conforms to the standards set out in the notification to be issued by the State Government in the official Gazette.

According to the amended order, existing units already manufacturing mixtures of micro-nutrient fertilisers for which standards have not yet been spe-

cified, may continue to manufacture, sale, sell, offer for sale, stock or exhibit for sale or distribute such mixture of micro-nutrient fertilisers for one year from the date of the amendment (July 28, 1988) or till the standards are prescribed by the State Government, whichever is earlier.

This is subject to the condition that before the expiry of the one year period, the units will follow the standard prescribed by the State Government and certificate of manufacture under clause 15 of the order.

It is also stipulated that no certificate of manufacturer shall be granted in respect of any mixture of fertilisers or mixture of micronutrient fertilisers which does not conform to the standards set out in the notification.

By another amendment to the Fertiliser (Control) Order of 1985, the Government has prescribed specifications for nitrophosphates. Eight specifications have been stipulated in regard to moisture percentage, total nitrogen percentage, percentage of nitrogen in ammonical form, percentage of nitrogen in nitrate form, percentage of neutral ammonium nitrate, soluble phosphate, percentage of water soluble phosphate, calcium nitrate percentage and particle size of the material.

The Fertiliser (Control) Order was issued on September 25, 1985. Subsequently, five amendments have been brought about on February 14, 1986, October 21, 1986, September 14, 1987, December 11, 1987 and March 1, 1988. The present amendment is the sixth in the last three years.

### HFC PLANTS' REVAMP TO COST ADDITIONAL RS. 986 CRORES

The Union Government will have to invest an additional amount of over Rs. 986 crores on four plants of Hindustan Fertiliser Corporation (HFC), which are to be rehabilitated.

The plants in question are the operating units at Namrup, Barauni and Durgapur and the Haldia project which is lying closed since October 1986 following a Government directive. The amount required to be invested on revamping these units has been estimated by the foreign consultants which were appointed by the Government to assess and formulate a package for the ailing plants.

Gram: SANCHEM

Hello : 28237/28238 Office  
27970 Resl.

**Attention**

**Indentors/Exporters For**

**Bismark Brown R**

**&**

**Crocein Scarlet MOO**

Contact Manufacturer :

**M/s. SANTOSH CHEMICALS**

2nd Floor, Everest Building,

Nr. Railway Goods Yard,

SURAT-395 003.



The Government has not yet taken a decision on the recommendation which were received only a couple of weeks back. But sources here say that the Government would be in a big dilemma as to whether to work out an additional Rs. 986 crores for investing in the plants, which is one of the top loss-making public sector units in the country with a workforce of over 4,421.

The reports of Toyo Engineering Corporation of Japan and Udhe GmbH, West Germany, have proposed that the Haldia fertiliser project can be rehabilitated and commissioned with an additional investment of about Rs. 500 crores. The proposal envisages that after rehabilitation, the ammonia plant can operate at 80 per cent capacity utilisation, urea and methanol plants at 90 per cent capacity utilisation and salt and acid group of plants (excluding the soda ash plant) at full capacity.

The consultants have suggested a similar package for operating HFC units of Namrup, Barauni and Durgapur. The package envisages that the units would be revamped in three principal stages so that only minimum loss of production is incurred. The rehabilitation cost is estimated at Rs. 80.39 crores.

According to the consultants, the plants will be achieving their individual rated capacities after they are rehabilitated as per the suggested plan.

HFC, with a paid-up capital of about Rs. 560 crores, produced fertilisers worth Rs. 153.74 crores in 1986-87 compared to Rs. 149.81 crores in 1985-86. Its losses in 1986-87 were estimated at Rs. 86.22 crores against Rs. 71.56 crores in the previous year.

The plant at Haldia was mechanically completed in 1979 but it could never commence commercial production on account of a variety of reasons till August 1986. The plant was on trial operations and production of 8,655 tonnes of ammonia, 1,905 tonnes of methanol, 13,889 tonnes of urea and 6,388 tonnes of nitrogen was achieved.

The basic problems faced by the Haldia plant were the inconsistency and frequent breakdown in oxygen compressors, leakages from the reversible exchangers of air separation plant, ammonia and methanol condenser leakage and frequent power interruptions. Ma-

intenance work was taken up in Aug.-September 1986 and subsequently the plant could not be restarted for trial operations in view of the directive from the Government in October 1986 to stop the commissioning activities.

However, special permission was obtained for carrying out limited trials on nitro-phosphate plant to establish the feasibility of the sulphate recycle process for nitro-phosphate production. In January 1987 the trial runs were carried out successfully on a small-scale, thereby, establishing that the process was prima facie workable.

Meanwhile, the Government decided to appoint foreign consultants to carry out an end-to-end survey and to submit the report for taking investment decisions to rehabilitate the project. The investment requirement of Rs. 500 crores is arrived at by these very consultants.

The licensed capacities of the Haldia project are: 1.65 lakh tonnes of urea, 2.52 lakh tonnes of NPK, 1.99 lakh tonnes of NP, 41,250 tonnes of methanol, 82,500 tonnes of sulphuric acid,

1.59 lakh tonnes of nitric acid 33,000 tonnes of phosphoric acid and 1.32 lakh tonnes of ammonium sulphate.

Even the two units of HFC's Namrup plant, the unit at Barauni and the one at Durgapur have been facing production constraints as a result of which their capacity utilisation has remained poor at 48 per cent, 40 per cent and 33 per cent respectively in 1986-87 compared to 38 per cent, 61 per cent and 30 per cent in the previous year.

The Namrup units, which produce ammonium sulphate, urea, sulphuric acid and ammonia, have been facing problems on account of the following factors: Diversion of ammonia from the first unit to the second unit, frequent fluctuations in natural gas pressure from suppliers end, power interruptions and equipment break-down in ammonia, sulphuric acid, ammonium sulphate and urea plants.

In view of all these factors, the consultants have suggested a major revamping of these plants so that these could achieve their rated capacities.

For Most Competitive CIF Offers For

## **Tobias Acid Turpentine Oil Dichlone And Other Chemicals**

Please Contact :

**M/s. K. SANGHVI & Co.**

308, 'Gulab', 3rd Floor, 237, P. D'Mello Road,  
BOMBAY-400 001.

Phone: Office: 268970/260711

Resi.: 8128473/8226451

Grams: 'KEYSANGHVI'

Telex : 11-73516 KSC IN



# FILTROLL

(Props : THE BANGALORE PAPER & PULP MILLS)

(SPECIALISTS IN ALL TYPES OF FILTER PAPER & CLOTHS)

All Kinds of Processing Industries

Washing & Cleaning Agents, Beverage & Foodstuffs, Paint and Beer and  
Distillery, Transformer Oil, Dyes and Chemicals, Pharmaceuticals etc.

Available From Ready Stock :

LITMUS GRANULES, LITMUS PAPER, SILVER ESTIMATOR & INDICATOR PAPER

Contact : **FILTROLL (India)**

Sales Office: 105, Princess Street, Damodar Bldg., 1st Floor, Bombay-400 002. Tel : 310817

Calcutta Branch: 48, Canning St., Janaki Centre, 1st Flr., Rm. No. 106, Calcutta-700 001. Tel: 42228

Factory: Plot No. 57/A, Bommasandra Indl. Area, Post: Bommasandra, Bangalore-562 158.

Bangalore Office: Anandaram Complex, 565, Avenue Road, 2nd Floor, Next to Syndicate Bank,  
Bangalore-560 002. Phone: 75745

FOR YOUR REQUIREMENT AT MOST COMPETITIVE PRICE

1) NIACINAMIDE I.P. Inj. Grade

3) NIACIN I.P.

2) NIACINAMIDE I.P. Oral Grade

4) ISONIAZID I.P.

Please Contact Manufacturer :

**M/s. Rajshi Chemical & Products**

Factory: Plot No. 81, Roop Nagar Ind. Area, Village: Loni, Dist.: Ghaziabad (U.P.).

Office: 1710/17, Mangal Bldg. No. 2, Bhagirath Palace, Chandni Chowk, Delhi-110 006.

Available From Ready Stock :

For Maharashtra Please Contact :

**PREM PASRICHA**

**M/s. MEDICINE CHAMBER**

Central Bldg. No.3, 2nd Floor, New Silk Bazar,

Opp. Kalbadevi P.O. Bombay-400 002.

Phones Offi. : 2864002/316650

Resi. : 6401714

For Your Imports-CIF Offers :

INOSITOL  
CITRIC ACID

TARTARIC ACID/CREAM OF TARTAR  
CETYL/STEARYL ALCOHOL

TOLUENE DIISOCYANATE  
COCO MONOETHANGLAMIDE/  
DIETHANOLAMIDE  
SODIUM HYDROSULPHITE/  
RANGOLITE

GLYCERINE

DIOCTYL PHTHALATE

ETC.

Also Domestic Offer :

VEG. OILS &  
GLYCERINE

CASTOR — NEEM — KARANJI — LINSEED — COCONUT —  
COTTONSEED — RICE BRAN — SOYABEAN — RAPE SEED OILS.  
DEHYDRATED CASTOR OIL — HYDROGENATED CASTOR OIL (WAX)

TOLUENE — BENZENE — ORTHO/PARA/MIX XYLENE — SOLVENT C 9.

CONTACT : **PRAGJI GOPALJI & SONS**

361, Maulana Azad Road, P.O. Box No. 3540, Bombay-400 004. INDIA.

Tlx. : 011-75646 PGCO IN

Phone: 861986

Cable: SPICESOIL.

REQUIRED IMPORT MANAGER — CHEM/PHARMA/PETROCHEM ON

PROFIT SHARING FOR BULK DRUGS/CHEM ORGANIC FINE.



## Panel to monitor industrial exports in 8th plan

The Government has set up a high-level steering committee for planning industrial exports during the Eighth Plan (1990-95) under the chairmanship of Dr. A. S. Ganguly of Hindustan Lever.

The 20-member committee comprises representatives from diverse sections of the industry, bureaucracy, banks, export-import houses, marketing bodies and universities. The group is to submit its report to the Government by December 31.

Amongst the committee's major tasks will be the assessment of the importance of manufactured and processed goods in accelerating industrial growth and to suggest measures for integrating export planning with industrial planning.

The panel will further review the performance of manufactured and processed goods export and identify key export items alongwith reasons for their predominance.

It will also identify hindrances in the way of higher growth in existing export items alongwith reasons for overcome them.

The panel will also evolve a strategy for a qualitative expansion in the export of manufactured goods so that the export of manufactured and processed goods constitute 10 per cent of the gross national product by the end of the Eighth Plan.

This may include considerations on changes in the prevailing fiscal and tariff policy framework, means to achieve technology and quality upgradation of export products, identification of markets with the greatest potential for export growth, changes in the administrative structure governing exports and industrial location policy affecting exports.

The panel will further identify major investment and necessary infrastructure for export promotion and consider ways

by which the State Governments may take appropriate measures for export promotion as an integral part of their industrial planning.

The working group has been empowered to co-opt any such official or non-official as member(s) as it may deem necessary.

Besides Dr. Ganguly, who is the Chairman of Hindustan Lever Ltd, the other members of the group are: Dr. P. C. Joshi, adviser (international economics), Planning Commission, Mr. A. V. Ganesan, Additional Secretary, Department of Industrial Development, Mr. P.G. Muralidharan, Additional Secretary, Ministry of Commerce, Mr. R. C. Chopra, Additional Director, Department of Electronics, Mr. Surindra Singh, Principal Secretary (Industry) UP, Mr. K. Mohan Chandran, Secretary (Industry), Kerala, The Chairman, Export-Import Bank of India, Mr. S.S. Dawra, Managing Director, National Agricultural Co-operative Federation of India Ltd., Prof. Deepak Nayyar, Jawaharlal Nehru University, Mr. Tarun Das, Director-General Confederation of Engineering Industry (CEI), Mr. K. Obayya, Executive Director, Trade Development Authority, Mr. H.S. Sandhu, Chairman-cum-Managing Director, Chinara Exports, Mr. Binay Kumar, Chairman, Banaras House Ltd., the Chairman, Tata Exports, Mr. B.M. Munjal, chairman, Hero Motors, Mr. G.H. Shah, president, Bharat Chambers of Commerce, the President, Federation of Indian Export Organisations, Mr. A.R. Matoo, carpet manufacturer and exporter, and Dr. Rakeshmohan, Economic Adviser, Planning Commission.

### PLANT PROTECTION CHEMICALS : 'ECOSYSTEM POLLUTED'

Kerala's minister for agriculture V.V. Raghavan said that "unscientific usage of plant protection chemicals had polluted not only the vegetables but also the ecosystem."

Inaugurating the three-day 10th

workshop on vegetable research, sponsored by the Indian Council of Agricultural Research (ICAR) at nearby Vellanikkara agricultural university campus, the minister called upon the scientists to find out effective ways and means to reduce the residual toxicity of many insecticides presently being used by the farmers.

He said the government had taken effective steps to augment the production of vegetables by increasing the area, using high yielding varieties and making the requisite inputs available to the farmers. About 300 scientists from all over the country are attending the workshop.

Speaking on the occasions, deputy director general of ICAR, Dr. K.L. Chadha, said India was the second largest producer of vegetables in the world with a total annual production of 45 million tonnes in an area of four million hectares.

The minimum requirement of vegetables in the country would be about 104 million tonnes by 2000 AD for an expected population of 950 million, he added.

He said the ICAR's all-India co-ordinated project had made many strides during the last 18 years. It had identified 92 new varieties of vegetables and standardised about 40 schedules for control of diseases and pests.

Mr. Chadha said that out of three lakh tonnes of vegetables consumed in the state annually, 1.5 lakh tonnes were being brought from the neighbouring states.

At present the per capita consumption of vegetables among Keralites was 30 grams a day as against the optimum requirement of 280 grams, he said.

The total requirement of vegetables in the state would be 31.1 lakh tonnes by 2000 AD and to achieve this an area of 1.55 lakh hectares had to be brought under vegetable cultivation.

A national research centre on onion and garlic would be established shortly, he said.



# FINE CHEMICALS & DRUGS

## Four more bulk drugs under price control

The Union Government is bringing bulk drugs used for four more national health programmes under price control. The Drugs Price Control Order of 1987 covered only bulk drugs used for seven programmes.

According to official sources, the Government is also planning for re-categorisation of some major bulk drugs.

The Ministry for Health and Family Welfare has already sent its list of bulk drugs, which need to be covered under DPCO 1987 to the Department of Chemicals and Petrochemicals in the Industry Ministry, which is the administrative agency for implementation of the price control order.

The department has also referred all the recommended bulk drugs to the Dr. Vijay Kelkar Committee.

Once the Committee completes its work, the Government would amend DPCO, 1987 to give effect to the re-classification of the drugs concerned. DPCO, 1987 has empowered the department to periodically review the list of price-controlled drugs and modify it.

The order included 27 bulk drugs used for six national health programmes

under Category-I, as per which the the maximum allowable post manufacturing expenses (MAPE) was fixed at 75 per cent.

Some bulk drugs needed for national family welfare programme including mother and child health, were also brought under the price control, but were classified under Category-II, as per which MAPE was fixed at 100 per cent.

The four national health programmes, to be covered under the enlarged DPCO, 1987, are sexually transmitted disease (STD) control programme, universal programme on immunisation, national aids control programme and the national goitre control programme.

The recommended drugs for these programmes are now being evaluated by the committee for inclusion in Category-I of DPCO, 1987. The criterion for inclusion in category-I is that the bulk drugs have to be used for health programmes.

Similarly, drugs commonly used for the maternal and child health programme (Vitamin-A, iron and folic acid) are being shifted from Category-II to category-I. Sera and Vaccines required un-

der the immunisation programme have also been recommended for inclusion under Category-I.

The Health Ministry has also recommended that paracetamol should be removed from Category-I. Also proposed are re-categorisation of rifampicin (now under Category-I) and exclusion of diazepam and other tranquilisers from Category-II.

It has mooted that tetracycline antibiotics should be preferred to other antibiotics and hydrocortisone for inclusion under price control.

A final decision on all these recommendations are expected to be announced shortly, sources in New Delhi say.

## GLINDIA BOYCOTT TO SPREAD AS TALKS FAIL

The pharmaceutical trade has threatened to spread its boycott of Glindia Ltd. to Delhi and hitherto unaffected States from September 1.

This follows the failure of the talks between the company and trade representatives arranged by the All-India Organisation of Chemists and Druggists in Delhi recently.

The wholesalers sought a uniform eight per cent margin on all products, inclusive of excise duty. Glindia offered half per cent increase on betamethasone range of products to five per cent and a one per cent increase, from five



"Let our superior specifications help you make a superior product"

for further details  
Please write to:-



**Caliron Chemicals**

P.O. BOX 184, LUDHIANA-141008.  
Grams: "Pellets" Phones: 24519/27330

## AVAILABLE REGULARLY:

- Sodium Hydroxide Pellets. Pharma/A.R.
- Potassium Hydroxide Pellets. Pharma.
- Succinic Acid. E.P.(99%)
- Guanidine Nitrate E.P.(98-99%)

Manufactured by:

"CALIRON" Group of industries



CALIRON CHEMICALS, LUDHIANA.  
CALIRON ORGANICS, LUDHIANA.  
Caliron Synth-Chem (P) Ltd., LUDHIANA.



six per cent, according to a trade spokesman. Wholesalers also sought an increase in retailer margins inclusive of excise duty, which was not acceptable to Glindia.

A Glindia spokesman said all that the company had offered was a one per cent increase in margins on non-beta-methasone products. He said the talks failed because the trade insisted on two pre-conditions: payment of new margins with retrospective effect with the proviso that the amount should be paid to AIOCD, and the demand to improve retailer margins.

According to Mr. Kishor Shah, AIOCD Vice-President, the company offered to hike margins on de-controlled products by two per cent if the trade agreed to fixing margin on controlled products as suggested by the company, but exclusive of excise duty.

He said, decontrolled products had a small share of the company's turnover. Additional two per cent on de-controlled products would have fetched about Rs. 60 lakhs more for the trade. Against this, the suggestion to calculate margins exclusive of excise duty would have robbed the trade of Rs. 1.42 crores, he said. In other words, acceptance of the proposal would have worsened the wholesalers' loss. The Glindia spokesman, however, denied having made such a proposal.

#### PESTICIDE DEVELOPMENT PROGRAMME INDIA

The Pesticide Development Programme India (PDPI) is conducting an Asia and Pacific Regional Training Programme on Quality Control of Pesticide Formulations for the UNIDO sponsored Asia & Pacific Regional Network project on pesticides (RENAP) under the sponsorship of the World Bank, FAO, UNIDO & UNDP. The programme is scheduled to run for a period of five weeks, beginning 1st November to 2nd December 1988. Representatives of the member countries of RENAP; Pakistan, Afghanistan, Bangladesh, China, India, Indonesia, South Korea, Philippines, Sri Lanka and Thailand, and officials of the sponsoring agencies and WHO are to participate in the training programme.

A distinguished faculty drawn from national and international organisations is likely to be on hand to deliver specialist lectures. The programme is highly practical oriented, wherein a bench chemist would learn to use all the modern techniques employed in pesticides analysis.

It has been decided to keep ten seats in the training programme reserved exclusively for the representatives of the Indian Pesticide Industry on first come first served basis. A general fee of Rs. 3000 per participant and for the associate members of the PDPI, a fee of Rs. 2,700 would be levied. The fee would cover course material, tea/coffee, daily lunch and validictory dinner, daily transport from Delhi and local site seeing but would not include lodging and out-station tours. The members of industry wishing to take advantage of this training programme may send their nomination along with a bank draft as above in the name of Hindustan Insecticides Ltd., Udyog Vihar, Gurgaon-122 016, Haryana, India, at the earliest.

#### BACTERIA-FREE WATER FILTER DEVELOPED

A domestic water filter that is so fine, it not only arrests impurities but also does not allow bacteria in the water that cannot even be seen by the naked eye to pass through its pores.

That is the claim made by Mr. S. S. Kalbag, managing director of Swan Micro Filters Pvt. Ltd., which has been manufacturing water filters, first for the industrial users, from 1977 and for use in homes from 1984, at Chinchwad.

Mr. Kalbag's efforts at last met with success, when he found cellulose was a better material for filtering water than ceramic, which are used in the candles or cartridges, fitted into the filters. Having secured a foothold in the market for filters with capacities of 900 litres per hour and above which are custom built, Mr. Kalbag turned his attention to producing filters that could be easily fitted on to taps at home which would deliver four to six litres of clean, bacteria free water straight from the tap every minute.

For Your Regular Requirements at Competitive Rates :

**Poly Vinyl Acetate Emulsion**  
**S-5, S-6 & SH**  
**Binder**  
**Fixer**  
**Coolant**  
**Softner of all Grades**

DICO SHOL L.M.  
 Lamination Adhesive for Paper, Paper to Polyester, Paper to D.O.B.P. DICO SHOL P.S. (Pressure Sensitive Adhesive).

Please Contact Manufacturers :

**DICOL PRODUCTS**

16/18, Dariyasthan Street, Yusuf Mansion,

1st Floor, R. No. 13, Bombay-400 003.

Phones : 342622/330337



*Announcing the Publication of*  
**DYESTUFFS DIRECTORY**

2ND EDITION

**Covering Dyes, Intermediates and Auxiliaries**

- SYNTHESIS OF TYPICAL DYES
- INTERMEDIATES FOR DYESTUFFS MANUFACTURE
- CHEMICAL STRUCTURE OF TEXTILE CHEMICALS
- STATISTICS COVERING IMPORTS, EXPORTS, PRODUCTION
- EXHAUSTIVE LIST OF MANUFACTURERS, DEALERS, AND INDENTING AGENTS OF DYES, INTERMEDIATES, AUXILIARIES, AND TEXTILE CHEMICALS
- INDUSTRIAL LICENCES/LETTERS OF INTENT
- ASSOCIATIONS AND THEIR MEMBERS
- TEXTILE AND ALLIED PERIODICALS
- TEXTILE AND ALLIED RESEARCH INSTITUTIONS

Price Rs. 225/-

Plus

Postage Rs. 25/-

For Details Contact :—

CIRCULATION DEPARTMENT

**SEVAR PUBLICATIONS**

**Bombay Office :—**

306, Shri Hanuman Indl. Estate,  
G.D. Ambekar Road, Wadala,  
Bombay-400 031.

Phones : 4131198/4120743

Telex : 011-76053 CWLY IN

**Madras Office :—**

27, Begum Sahib 3rd Street,  
1st Floor, Mount Road,  
MADRAS-600 002.

Phone : C/o. 831808

Telex : 041-6290



## STC secures contracts from Algeria

The State Trading Corporation (STC) has made a breakthrough in the Algerian market by securing contracts for export of drugs, pharmaceuticals and chemicals worth Rs. 12.76 crores. The contracts were won against stiff competition from firms in advanced countries, it is claimed.

The break-up is: drugs and pharmaceuticals Rs. 10.7 crores, agro chemicals Rs. 1 crore, and chemicals (Sodium sulphate) Rs. 0.96 crore.

Shipments of pharmaceuticals and chemicals worth Rs. 4 crores to Algeria are expected to be completed by the end of September next. Export of drugs and pharmaceuticals worth Rs. 5.34 crores would be shipped in the next financial year.

With the Algerian contracting, STC has export orders on hand worth Rs. 25 crores. The export target for drugs, pharmaceuticals and chemicals for 1988-89 is Rs. 33 crores which is expected to be exceeded, according to STC sources.

STC has entered the US market for the first time. It will export dyes and dye intermediates worth Rs. 27 lakhs. STC sources expect to get more orders from that country once the first order is executed satisfactorily.

Moreover, it will export dye intermediates and antibiotics worth Rs. 7 crores to China through Hong Kong. Efforts are being made to tap this potential market, the sources explain.

Besides, STC will export bulk drugs and antibiotics to West Germany worth Rs. 3 crores in the current year. This order was secured recently.

It will also export antibiotics worth Rs. one crore to Syria.

Interestingly, STC has signed contracts for the import of 900 tonnes of Benzene from Turkey. The whole quantity is scheduled to arrive by the end of this month.

Benzene will be supplied to user industries for export production.

## KREBS SWISS SIGNS INDIAN SALT UPGRADING CONTRACT

Krebs Swiss has won a contract to supply a salt upgrading plant to Gujarat Alkalies and Chemicals (GACL) who operate a chlorine plant at Baroda, India.

The project, based on the SALEX process, will have a capacity of 40 t/h upgraded salt. It represents KREBS SWISS's first contract for this type of plant in India. Further orders are expected in the near future because of poor quality of Indian solar salt. In the chloralkali industry, impurities in salt are causing high cost of brine treatment and excessive mercury pollution.

GACL, who use barium carbonate, caustic lye and soda ash for brine purification, expect the SALEX process to reduce their cost of brine treatment chemicals by about a half. Discharge

of mercury contaminated sludge will be reduced by almost 70%. The project is estimated at approx. 1.3 crores Rupees (US\$1 mill), is expected to have a payback of less than one and a half years. Most of the equipment will be manufactured in India.

The SALEX process, developed by KREBS SWISS, is an advanced, low cost salt purification technology engineered for high efficiency, low losses of salt, low consumption of power and water and high return on investment. The process finds application in chlor-alkali and soda ash manufacture, refined table salt production and processing of salt in mines and solar saltworks. The achievable product purity is 99.5-99.9% NaCl. The first 15 t/h SALEX plant went into commercial operation in Olhao, Portugal in 1983.

KREBS SWISS, Zurich, is an independent firm of chemical engineering contractors and consultants serving the chemical, electrochemical and salt industries throughout the world.

# EDTA

(Sequestering/Chelating agents)

EDTA	NTA
EDTA DI SODIUM	NTA TRI SODIUM
EDTA TETRA SODIUM	Zn-EDTA Fe-EDTA Cu-EDTA Mn-EDTA <b>MICRO NUTRIENTS</b>
EDTA TETRA SOLUTION	
EDTA-FERRIC SODIUM	
EDTA-FERRIC AMMONIUM	
EDTA DI POTASSIUM	



Manufacturers

**SONY CHEMICALS**

1/2, Darshan Udyog Bhavan, Safed Pul, M. Visanji Rd.,  
BOMBAY-400 072. Phones: 5123272/ 5136822  
Gram: 'NEWGENER', Telox: 011-7239 8 SOC-IN



## Drug firm chief held in FERA case

The president of Burroughs Wellcome, Mr. D. K. Bose, was arrested by enforcement directorate in Bombay on the charge that the multinational pharmaceutical firm siphoned off foreign exchange worth Rs. 1.35 crores in violation of the Foreign Exchange Regulation Act.

Mr. Bose was ordered to be released in a bail of Rs. 5 lakhs by the additional chief metropolitan magistrate, Mr. R. N. Patil.

The enforcement directorate raided the company and Mr. Bose's residential premises and seized incriminating documents, it was stated.

The company allegedly made illegal remittances to its principals, Wellcome Foundation, U.K., by overinvoicing imports made from them.

An additional company secretary of the firm, Mr. D.C.T. Tanna, was interrogated on May 9 this year and the department learnt that the company had imported trimethoxy benzaldehyde from a firm in Holland through the Wellcome Foundation Ltd. In September-October, 1986, two consignments were

received. For four consignments weighing 17,800 kg., the Indian company remitted an excess of Rs. 11 lakhs with an intention to retain the funds abroad, it was alleged.

The international prices of a drug triptolidine, was between £515-710/kg. However, Wellcome Foundation allegedly inflated the price and sold it to its Indian subsidiary at prices ranging from £850 to £1047. The inflated amount in the imports made between 1982 and 1987 by the company was about Rs. 1.24 crores, according to the enforcement directorate. The directorate had confirmed the prevalent price of the imported drugs and the invoice price was clearly inflated, the court was told.

Unaccounted cash of Rs. 7 lakhs was seized from the residence of Mr. Bose. A number of important documents were also seized from the residence and office premises. The magistrate directed Mr. Bose to attend the office of the enforcement directorate daily to help in the investigation.

Burroughs Wellcome, originally a

100 per cent foreign company, diluted its foreign holdings to 40 per cent in 1984. Though 60 per cent of the shares of the company are held by Indian public, the management was under the control of the foreign firm.

Though, subsequent to dilution, company's foreign remittances should have proportionately reduced, in reality it was not so. Since the Indian firm had the facility of importing raw materials from its own counterpart abroad there was ample scope for manipulating invoiced prices. Sources in the enforcement directorate said.

The company was earlier raided in 1985 and show-cause notices were issued subsequently. The case is still pending for adjudication.

### NOTIFICATION ON GELATINE CAPSULE GEAR IMPORT

The Government has prescribed the conditions which will govern import of 950 high speed hard gelatine capsules basic machines at concessional duty. First, at the time of clearance of the goods, the intending importer shall produce to the Assistant Collector of Customs, a certificate issued by an officer not lower in rank than a Joint Chief Controller of Imports and Exports.

The certificate would testify that the importer has executed a bond specified in this regard by the Chief Controller of Imports and Exports undertaking to export gelatine capsules of three times the value of the imported machinery within a period of five years from the date of clearance of the said machinery.

The certificate would also testify that the importer has undertaken to comply with such instructions as are issued by the Chief Controller of Imports and Exports to monitor and enforce the fulfilment of the export obligation.

Secondly, the intending importers have to execute an indemnity-cum-guarantee bond as specified in the relevant annexures with the regional licensing authority concerned before clearance of the goods through the customs.

The amount of indemnity-cum-guarantee bond shall be equal to an amount equivalent to the difference between the normal rate of customs duty including additional, auxiliary and countervailing duties leviable and the duty actually paid for import under the concessional rates as per the notification of May 25, 1988.



**MARK OF QUALITY**  
**IF NOW AVAILABLE IN ANY QUANTITY**  
**AS AND WHEN REQUIRED BY YOU**

**BENZYL CHLORIDE**  
**BENZO TRI CHLORIDE**  
**BENZOYL CHLORIDE**  
**BENZALDEHYDE**  
**GWALIOR CHEMICALS PVT. LTD**

**Factory :**

Birlagram,

NAGDA (MP) 466 331.

Phone : 283/104

**Regd. Office :**

29, Bank Street, 1st Floor

BOMBAY-400 023

Phone : 2862453/2863021

Gram : "METALD'S"

Telex : 011-6554 MINA IN.



## FOOD GRADE PLASTICS :

**Measures to ensure easy availability**

A series of measures are soon be taken to ensure easy availability of food grade plastics meant for packaging of processed foods.

These steps are being taken, official sources say, as part of the strategy to promote development of the processed foods industry. It has been identified as a major thrust area for exports in the next few years. Packaging of processed foods in internationally accepted modes has therefore assumed significance.

The proposed measures include reduction in import duties of polyester chips bottle grade as well as on equipment needed to manufacture containers made of such plastics. Incentives will also be given for setting up more bottle-making units based on food grade plastics.

Currently, it is pointed out, a large number of processed foods are being packaged in unsuitable plastics. For instance, recycled PVC (poly vinyl chloride) is being used for many processed foods even though this reduces the shelf life of such products.

Processed food manufacturers are reluctant to opt for bottles made of polyethylene terephthalate (PET) or what is known as polyester chips bottle grade, because of high prices of this raw material. With the steps now proposed to be taken, the government expects that PET prices will fall, thereby making use of PET bottles and containers economically viable.

Apart from high prices, another problem being faced is inadequate availability of PET by bottle-making units. At present there is only one indigenous manufacturer of PET with an installed capacity to 1,200 tonnes per annum. The existing demand is about 2,000 tonnes per annum for bottle manufacturers and this is expected to rise to 3,200 tonnes per annum by 1988-89.

Although imports are being allowed to meet the balance requirements of industry, duty has been pegged at 245 per cent ad valorem. This would ensure that the landed cost of these chips is brought in line with that of other thermoplastic raw materials used for packaging purposes.

Similarly, it has been decided to cut the import duty on stretch blow moulding machine used for PET bottle pro-

duction, from 90 per cent to 35 per cent.

**NYLON-6 PLASTIC, A BOON TO INDUSTRY**

The use of nylon-6 as a versatile engineering plastic has been assuming greater importance in various fields in the industry. That it has several advantages over ferrous and non-ferrous materials has been proved in the case studies undertaken by the Gujarat State Fertilizers Co. (GSFC).

Nylon-6, the new material has proved to be the best alternative to conventional materials like metals, glass, wood and leather, and has vast scope for different applications in industries like automobile, textiles, engineering, electronics and food and oil packaging. In order to highlight the importance of nylon-6 in national economy, GSFC organised an exhibition in New Delhi. A large number of products made from nylon-6 were on display alongwith panels showing the advantages of this material over many steel parts and as alternative material for packaging.

Mr. J.P. Shah, GSFC Marketing Director, described it as a futuristic plastic with a potential to revolutionise industry and lifestyle of the people. The company is the largest manufacture of Nylon-6.

FOR YOUR REQUIREMENT OF :

**POLYVINYL ALCOHOL**

CELLACELL 198 (COLD WATER SOLUBLE)

CELLACELL 279 (HOT WATER SOLUBLE)

Manufactured in India by

**Cellulose Products of India Ltd**

KATHWADA, AHMEDABAD.

AND ALSO

SODIUM CARBOXY METHYL CELLULOSE (CMC) ALL GRADES.

MONOCHLORO ACETIC ACID/DICHLORO ACETIC ACID/

SODIUM MONOCHLORO ACETATE/METHYL ACETATE.

SODIUM ALGINATE (ALL GRADES). / ALGINIC ACID.

AGAR AGAR ★

CELLULOSE POWDER

MICROCRYSTALLINE CELLULOSE POWDER.

CONTACT :

**Om Neelkanth Drugs and Chemicals Pvt. Ltd.**

34, National Chambers, Ashram Road, Ahmedabad-380 009.

Phone Ahmedabad: 468991, Bombay: 224636/232267, New Delhi: 262481.



## Bombay Dyeing hikes DMT price

Bombay Dyeing, the largest DMT manufacturer in the country, has raised its selling price by Rs. 6,000 per tonne to Rs. 27,000 ex-factory. The selling price of Rs. 21,000 per tonne had remained unchanged since 1983.

It might be recalled that the other two DMT manufacturers in the country, IPCL and Bongaigon Refineries had raised their selling prices from Rs. 21,000 to Rs. 23,500 per tonne with effect from August 8, 1983. Reliance Industries, the only PTA manufacturer in the country, had also hiked its selling price from Rs. 23,650 to Rs. 26,500 per tonne from the same date.

DMT and PTA are the major raw materials for polyester industry. The price hike was demanded by the DMT/PTA manufacturers due to high cost of paraxylene, their major raw material. In the absence of domestic availability of paraxylene, Bombay Dyeing relies on 100 per cent imports.

Over the last few months the paraxylene price in the international market has gone up considerably and additionally the import duty on paraxylene was raised from 35 per cent to 120 per cent ad valorem in March 1983.

"This increase, coupled with the rise in the international price of paraxylene and the fall in the value of the rupee, has resulted in a two-fold increase in the landed cost of paraxylene, from Rs. 10,200 per tonne to a staggering Rs. 21,600 today. Of this hike of Rs. 11,400 per tonne, as much as Rs. 7,000 is accounted for by the increase in the import duty," Bombay Dyeing claimed in a statement issued in Bombay on August 19.

The company had represented to the government that all manufacturers of DMT and PTA should have equivalent input costs and for which imports duty on paraxylene should be reduced appropriately. "In the absence of a decision so far on this matter, it has now become impossible for us to continue to absorb the abnormally high cost of paraxylene, as we have done for over five months," the company stated.

During the first four months of 1983, the company's DMT plant had operated at 105 per cent of its rated capacity. "This limits any major cost economies that management can make. We are, therefore most reluctantly, and as a

last resort, raising our selling price of DMT to Rs. 27,000 per tonne explant," according to the statement.

"Being dependant 100 per cent on imported paraxylene, our price increase has, of necessity, to be larger than those who rely either fully or substantially on captively produced paraxylene. Should the government reduce the paraxylene duty to equate our paraxylene costs with that of other producers, we will be glad to review our selling price," the company added.

### PRESSURE ON FIBRE UNITS

The hike in the DMT price of Rs. 6,000 per tonne by Bombay Dyeing has generated lots of confusion in the polyester industry.

The DMT consumers, who get supplies from IPCL and Bongaigon Refineries will receive it at Rs. 23,500 per tonne, while those depending on Bombay Dyeing will have to pay Rs. 27,000. Further, PTA will be available cheaper at Rs. 26,500. All DMT/PTA consumers, however, will have to sell their polyester fibre and yarn at competitive prices.

According to a major DMT consumer of Bombay Dyeing, he will be out of the market unless he sells his product at a loss. He said his company has been hit, first by the galloping cost of MEG and now by the DMT price. The government should either allow other DMT/PTA manufacturers to raise their prices accordingly or should ensure that all polyester units receive their raw material at equitable price, he added.

This has raised another issue as to whether more units will prefer to go in for PTA. The problem, however, is whether Reliance Industries is in a position to meet any additional demand, after meeting its captive consumption and the needs of four units who have decided to switchover to PTA.

### TEXTILES MILLS STRIKE : DYESTUFF INDUSTRY DIVERSIFIES

The dyestuff industry is coming out of the woods after a torrid time in the wake of the textile mills strike.

According to a study by the commerce research bureau in Bombay the 18-month-old strike in 1982-83 has forced the decaying industry to increa-

singly diversify and broad-base its product range thereby reducing its dependence on the textile sector to a large extent.

Large and medium units have started shifting their product mix in favour of more technologically sophisticated products. Exports have also perked up in view of the advanced countries' preference to import their requirements.

Dyestuffs are consumed mainly by textiles, paints, printing ink and paper industries. Other consumers include leather, jute, leather, plastics, foodstuffs and cosmetics. The textile industry consumes more than 80 per cent of the total dyestuff production.

The number of establishments in the small scale sector was estimated at 900 in 1984 and the production estimate was put at 6,500 tonnes, around 25 per cent of the total production.

Textile fibre consumption in 1970-80 increased by 43 per cent while the population grew by 27 per cent, the difference reflecting the increase in the per capita consumption of textile fibres. Dyestuff consumption grew at 93 per cent for the same period due to increased production of coloured fabrics, particularly printed fabrics where consumption of dyestuff is higher.

The present per capita consumption of cloth in India at 15 metres/annum is one of the lowest in the world. It is expected to increase to 19 metres by the end of the Seventh Plan (1989-90).

Based on the past trends, the consumption in textile and other industries is projected to grow to about 62 gm in 2000 from 39 gms in 1980. However, this figure is also less than the world average of 200 gms.

### MAFATLAL DYES

Despite a drop in net sales to Rs. 20.57 crores from Rs. 22.29 crores, Mafatlal Dyes, and Chemicals earned a higher gross profit of Rs. 97.98 lakhs during the first six-month period ended June 1983 against Rs. 90.10 lakhs in the same period last year.

The net profit is also better at Rs. 50.73 lakhs against Rs. 47.80 lakhs after depreciation (Rs. 7.44 lakhs against Rs. 7.40 lakhs) and taxation (Rs. 39.79 lakhs against Rs. 34.90).



## Acetic acid from methanol

Recently there was some controversy over acetic acid production from methanol. The alcohol-based industries stated that the country has enough installed capacity of acetic acid based on alcohol as the feedstock. It is opposed to setting up of any acetic acid plant using methanol as the feedstock, which in turn is produced from coal. The irony is that some of the existing acetic acid manufacturers had applied to the Government for acetic acid manufacture based on methanol in 1986 along with some other applications. The Government after taking into consideration several factors, had taken a conscious decision in the end of 1986 on giving letter of intent to M/s. Narmada Valley Fertilizer Co. (NFC) for producing 40,000 tpa acetic acid using methanol as the feedstock (for which it has a licence for 10,000 tpa).

Recently some structural changes have taken place in the alcohol and alcohol-based industry mainly because one of the three major users of alcohol

viz. IEL closed down its plant for the manufacture of LDPE in West Bengal. However, there are reports that this second hand plant has been bought for installation in UP. The second plant viz. Synthetics and Chemicals resorted to imported butadiene instead of producing the same using alcohol which they have been doing all these years. The third plant viz. Union Carbide is closed down in Tirunelveli on the grounds that it is not safe to operate. The reasons for this state of affairs is largely due to short term policies followed by state governments in pricing alcohol, levying excise duty, transfer duties and so called 'export duties'. If alcohol is really going to be surplus, should not the country consider setting up import substitutable products, butanol and butadiene to name some. The foreign exchange savings shall be enormous. Further, using acetaldehyde as the building block, some products other than acetic acid and could also be considered. It may also be worth considering blending alcohol with motor spirit,

which we have, of late realized that our demand exceeds that produced by our refineries, thanks to the liberal automobile policy of Government.

It may be added here that All India Alcohol Based Industries Development Association has always been representing that its members do not get adequate quantities of alcohol for operating their plants to fairly good capacities. Even though acetaldehyde and acetic acid plants are scattered all over the country, one finds transportation of these commodities over long distances e.g. from UP/Bihar/Maharashtra to Rajasthan/Gujarat. Though statistics show that adequate installed/approved capacity of acetic acid exists in the country, some of the units have closed without any chance of their reopening. Further, efficiencies of some of the plants also need a review. Moreover, demand of acetic acid is increasing in dyes and pharmaceuticals.

It may be mentioned here that whenever a proposal for alcohol-based project is put up by an 'alcohol deficit' State, it is rejected on the grounds of non-availability of alcohol in that State.

## A RANGE OF QUALITY CHEMICALS...

**CUSTOM SYNTHESIS —  
OUR SPECIALITY...**

- Liquid Fatty Acids
- Solid Fatty Acids
- Fatty Amines
- Fatty Diamines
- Fatty Amides
- Castor Products

- Corrosion Inhibitors
- Biocides
- Anticaking Agents
- Fabric Softeners



THE BOMBAY OIL INDUSTRIES PVT. LTD.  
Fatty Acids & Chemicals Division  
Lal Bahadur Shastri Marg, Bhandup,  
Bombay-400 078.  
Tel.: 560 16 36/37 Gram: FATTYAMINE  
Telex: 011-71922 BOI-IN



When the 'alcohol deficit' States put up a proposal for a project using an alternate feedstock to alcohol, it also does not find favour because alcohol is available in other 'surplus' States. This policy acts as a hindrance to development. Moreover, the difficulties in getting inter-state alcohol allocation and release in addition to high cost of transportation are too well known to need any elaboration.

When large PTA plants are being considered in the country, with an investment in excess of Rs. 100 crores for each of the plants, this investment needs to be supported with assured and dependable supply of various inputs including acetic acid. This could only be possible if large plants of acetic acid are set up, based on feedstocks other than agrobased. Considering the fact that a PTA plant is being set up in the western region which also has large gas reserves, the choice of location and feedstock for acetic acid plant are obvious. We may also learn from the track record of alcohol as well as acetic acid production in the country and create a base for an alternate feedstock, more so when it is abundantly available. Such a proposal also needs encouragement from lower cost of production angle. We seem to be living in a high cost economy for so long that we do not want to come out of it. With suitable pricing of gas and fuel, acetic acid based on methanol can be much cheaper than the current ruling prices.

From time to time, the Government of India had appointed expert committees for studying alcohol based industries. It is likely that some of the earlier recommendations are not valid today in view of changing scenario. However, the latest report of Dr. Ganguly Committee on alcohol based industries merits immediate consideration of Government.

In summary, the fact remains that some of the existing alcohol based acetic acid plants have closed down and some are inefficient/obsolete. There have been wide fluctuations in the prices of indigenous acetic acid in addition to erratic supplies at times, necessitating imports. Existing acetic acid plants, having low book values, can be encouraged to switch over to import substitute products, using acetaldehyde as the building block. Acetaldehyde based products may be de-licensed on the lines of phenol based products, de-licensed recently. Alcohol, if surplus in the long run, may be used in producing import substitute products and in blending with motor spirit to supplement the ever increasing fuel needs of automobiles. Such steps are likely to result into enormous savings of foreign exchange against one time cost of technology for acetic acid based on methanol. Large acetic acid plants, using gas based methanol, can only ensure consistent supply to large PTA plants. There is also a need of utilizing gas

for purposes other than fertilizers, petrochemicals and power generation.

It has been the policy of the Government of India to encourage new technologies as a step to enter 21st century with the prime objectives of bringing down cost of production by taking advantage of economies of scale and encouraging adequate availability of products with fair competition. The proposal of encouraging methanol based acetic acid plants is in line with the Government of India's policy and should not be blocked at this advanced stage, when GNFC has gone ahead and finalised foreign collaboration agreement with the process licensor. It may be mentioned that Monsanto had developed the process of manufacturing acetic acid from methanol and there are very few plants in the world which are licensed to this technology. GNFC was successful in negotiating this latest technology for the first time in India from B.P. Chemicals, UK who are the sub licensors of this technology and have signed FC agreement. B.P. Chemicals have now decided not to license this technology to new incumbents.

• GNFC also finalised foreign contractors for carrying out the detailed engineering for this Rs. 70-crore (approx.) project after evaluating several bids and after due negotiations. — A. K. A. RATHI in FINANCIAL EXPRESS.

AVAILABLE FROM READY STOCK :

**CHLOROSULPHONIC ACID**

(2.5 KG. BOTTLE, 320 KG. BARREL)

**BORAX & BORIC ACID (50 Kg. Bag)**

**HYDROGEN PEROXIDE (50 Kg. Carboy)**

Please Contact :

**SDBB CHEMICALS (INDIA)**

H.O.: Satnarayan House, Section 17,  
Ulhasnagar-421 003.

Phone : 78238/75992/70096

Branch : 94, Surat Street, 5, Fancy Chambers,  
Masjid, Bombay-400 009.

Phone: 346651/335936/334588

Authorised Dealers : THE DHARAMSI MORARJI CHEMICAL CO. LTD.



## SC turns down plea against modis

The Supreme Court has turned down a plea of monochloro acetic acid (MCA) manufacturers that the Modis be restrained from implementing their 180-lakhs MCA project in Alwar, Rajasthan.

Eight MCA manufacturers had objected to the proposal of Modi Alkalies and Chemicals Ltd. to set up a 2,000 tonne plant. Their objections had earlier been turned down by the Monopolies and Restrictive Trade Practices Commission (MRTPC). The Supreme Court upheld the MRTPC ruling.

The MCA manufacturers objected to the proposal on the ground that a large house like Modis ought not to enter this field where medium-size and small scale units are already struggling to sell the product because of stagnant demand. The bulk of MCA is captive consumed, and trading is only in the region of 2,500-3,000 tonnes, according to industry sources.

The existing units together have around 10,000 tonnes of installed capacity. There are four manufacturers in the organised sector and six small-scale units, out of which three are under the sick list and are beneficiaries

of Government's nursing schemes. The creation of fresh capacity, therefore, is unjustified, they told the court. The third objection was that the Modis are going in for foreign technology which is again unwarranted.

The Modis argued that demand for MCA is bound to increase because of the growth in the consumption of MCA-based weedicides, pesticides and other chemicals. Also, MCA had export potential. It attributed the underutilisation of existing capacity to "inadequate technology."

MCA is made by chlorination of acetic acid. (The Modi caustic soda plant has surplus chlorine for captive use). The company will reportedly pay Rs. two crores for purchase of foreign technology. The Regional Research Laboratory of Hyderabad had expressed its inability to provide the technology sought by Modis and hence the decision to go for collaboration.

### PLEA FOR IMPORT DUTY REDUCTION

The polyester industry has urged the government to drastically reduce import duty on raw materials such as MEG, DMT and PTA.

This plea has been made in view of the spiralling international prices of these raw materials as also to lessen the impact of the steep hike in their prices effected by indigenous manufacturers.

The Association of Synthetic Fibre Industry, in a representation to the ministries of finance and textiles and to the department of chemicals and petrochemicals, has pleaded for an import duty reduction from the existing level of 195 per cent to 90 per cent ad valorem in the case of DMT/PTA. In the case of MEG it has requested for reduction in customs duty from 90 per cent ad valorem to a specific rate of Rs. 1,200 per tonne.

### PLEA TO REMOVE PRICE CONTROL ON DRUGS

Participants at a seminar conducted by the All India Organisation of Chemists and Druggists Educational Trust on Aug. 21, demanded removal of the existing price control and abolition or reduction of taxes and duties on medicines, at least on life-saving drugs.

Speaker after speaker at the seminar on 'price control on medicine—its relevance to consumers' said the drug industry was in 'great trouble'.

We Offer A Best Quality at a very Competitive Rates For Your Small & Bulk Requirements Of :

**Phosphorous Tri Chloride (PCl<sub>3</sub>)**  
**Phosphorous Oxy Chloride (POCl<sub>3</sub>)**  
**Phosphorous Pentoxide (P<sub>2</sub>O<sub>5</sub>)**  
**Tri Ethyl Phosphate (TEP)**  
**Tri Chloro Molybdenum Phosphide (TCMP)**

Please Contact Manufacturers :

## SANDHYA DYES & CHEMICALS

Regd. Office & Works :  
 Plot No. 1703, G.I.D.C. Sarigam,  
 SARIGAM-396 155.  
 Bulsar (Gujarat).  
 Phone : 149 (Bhilad Exchange)

Bombay Sales Office :  
 5/1, Modern Villa Bldg.,  
 7th Road, Santacruz (East)  
 Bombay-400 055.  
 Phone : 6146516



## NEWS DIGEST

### RAW MATERIAL PRICE HIKE HITS PAINT UNITS

The paint industry has seen a negative growth of 7.2 per cent for the period April 1987 to February 1988.

Among the reasons for this stunted growth is indiscriminatory pricing policy for the main raw material titanium dioxide and rutile, according to a press note of the Indian Paint Association.

While the industry is far from healthy, Kerala Metal & Minerals Ltd. (KMML), Quilon, sole manufacturer of these raw materials, revised the selling prices of rutile five times in the last two years and quantum-wise it was as much as 66 per cent.

Although the state sector unit has an installed capacity of 24,000 tonnes of rutile and it went into commercial production in December 1984, since the date of commencement of the plant, it produced maximum of 7,000 tonnes per annum.

The press note adds that the raw material, ilmenite for manufacture of rutile is available in abundance in the country. Cost of production of rutile in India cannot be higher than the cost of production of rutile elsewhere in the world. Yet selling price of KMML rutile is \$4,225 per tonne compared to world price of \$2,300 per tonne.

The association alleges that KMML is exploiting monopoly situation by revising selling price in a manner prejudicial to the interest of the paint industry and the country at large.

The latest price increase on July 13 this year amounts to 24.5 per cent in one stroke which has delivered a mortal blow to the already ailing industry.

### BIOLOGICAL E. VENTURES IN POULTRY VACCINES

The Hyderabad-based Biological E. Ltd., a leading manufacturer of life-saving drugs like Neo-Hepatax, ATS and Tripac, is setting up a Rs. 100-lakh joint venture for producing a wide range of poultry vaccines in collabora-

tion with the Solvay Group of Belgium world's largest manufacturer of poultry vaccines.

The new company, Solvay B.E. Animal Health Ltd., will begin operations at Gaganpahad in Ranga Reddy district of Andhra Pradesh to produce modified live poultry vaccines, inactivated poultry vaccines, bacterins and diagnostic aids, according to Mr. Ravl Chowla, Director of the Bombay-based Egg and Poultry Industry Centre (EPIC). According to him, many of the items will be produced for the first time in the country.

With this venture, Indian poultry farmers will have access to the latest technology and experience of Salsbury Laboratories Inc. of US, a subsidiary of Solvay Group. This venture, which was recently approved by the Government, is also the first to have a equity participation from the foreign collaborator, while till date Indian poultry vaccine companies, including the one belonging to Pune-based Venkateswara hatcheries have had only technical collaborations from abroad, it is said.

The Solvay Group will hold 40 per cent equity and provide certain specific pathogen free egg unit technology to the Indian company free of cost. The new company has planned to manufacture seven important poultry vaccines in the first year to be followed by six more ranges in the second year and another three in the third year.

The agreement provides for training of Indian personnel at Salsbury Lab's veterinary biological facilities in the US and Brazil besides establishing a Salsbury Poultry Health School in India.

### IICHE OFFICE BEARERS

During the Seventh Annual General Meeting held on 7th August, 1988, the following were elected as members of the Executive Committee of Indian Institute of Chemical Engineers, Ahmedabad Regional Centre, for the year 1988-89:

Chairman : Dr. M. C. Chhabra  
Vice-Chairman: Shri A. K. A. Rao  
Hon. Secretary : Shri R. N. Shukla  
Hon. Jt. Secretary : Shri D. Bhattaraya, Dr. C. M. Ramasamy; H. S. Treasurer : Shri H. R. Shah; Members: Shri G. C. Joshi, Shri H. L. Shri M. N. Patel, Shri F. B. V. Shri P. J. Bhatt, Shri M. L. Agarwal  
Immediate Past Chairman : Shri A. P. Sheth.

### NICCO BAGS DSP NAPHTHALENE PLANT CONTRACT

The Nicco Group's project division has bagged a high-technology Rs. 40 crore turnkey contract from Durgam Steel Plant for establishing a facility to produce 7,500 tonnes per annum 98.5 per cent pure naphthalene from crude oil. Mr. Rajive Kaul, head of the group, said Nicco has tied up with BEFS technologies of France for know-how on the DSP project.

One of the special features of the plant offered by Nicco is that it has fully computerised process control, complete operation controlled through a PC with hot back-up. Nicco's project division, which has a Rs. 12-crore per order intake in the two-and-half years since inception, has made bids for another Rs. 55-crore worth of turnkey overseas contracts. On the domestic front, the company has on hand contracts from a number of clients, including NHPC, DSP, Hindustan Zinc and the Calcutta Metropolitan Development Authority.

### FIRST BENZENE CONSIGNMENT TO ARRIVE SORTLY

The first import consignment of benzene, arranged by the Government to ease the current shortage of the material, is expected to arrive at Kandivli shortly.

Another import consignment is expected to arrive by September end, according to industry sources in Bombay. However, the quantity involved could not be ascertained.

A delegation of chemical manufacturers had called on Mr. H. K. Khanna, Secretary, Department of Chemicals and Petrochemicals, recently. Following his intervention, refineries have begun releasing "small quantities", one manufacturer told 'Financial Express'.



INDO-USSR SEMINAR ON

## Industrial applications of electron accelerators

An Indo-USSR Seminar on "Industrial Applications of Electron Accelerators" organised by Bhabha Atomic Research Centre (BARC) and the Academy of Sciences, USSR will be held during Nov. 1-3, 1988, at BARC, Bombay. The Seminar is sponsored by the Department of Science and Technology, Government of India. The Seminar will include presentations by eminent Soviet scientists, covering the manifold applications of Electron Beam (EB) technology practised in the industry, as also presentations by Indian participants covering areas of potential and immediate applications in the Indian industry. The seminar will enable the Indian industry to obtain first hand information about Electron Beam applications in various spheres of industry.

### Objective

In the expanding field of radiation processing Electron Beam (EB) technology has occupied a pre-eminent position today. EB technology enables high speed processing because of the ability of EB machines to deliver large radiation doses in a short time. Hence industrial processes such as wire and cable cross-linking, continuous production of heat shrinkable packaging materials, tubes and insulators, surface curing of coatings and paints on various surfaces, special coatings for audio and video tapes, printing, lithography, routinely employ this technology. EB processes enable producing better qua-

lity materials, reduced energy consumption and reduced environmental pollution. EB cured wires and cables, polyethylene foam, polyethylene pipes for hot water circulation are household products in the developed countries. The other areas of potential applications include flue gas detoxication and sewage sludge hygienisation, where EB processes have certain unique advantages.

Recognising the importance of this technology to the fast developing Indian industry, this Seminar has been arranged to coincide with the formal commissioning of the industrial research EB accelerator at BARC, Trombay. The Seminar will greatly help in disseminating the latest information on EB irradiation processes and technology and will open up avenues to Indian industry for updating the technology and introducing new products.

### Programme

The seminar will comprise of presentations by invited speakers and panel discussions only. It is proposed to bring out the proceedings of the seminar in the form of a publication. The seminar will include visits to EB accelerator facility and other radiation facilities at BARC.

There is no registration fee for the seminar.

Further information can be had from Mr. K. Krishnamurthy, C/o. BARC, Trombay, Bombay.

## MOVE TO EXPORT ENTIRE NALCO OUTPUT RESENTED

The reports that the Government has decided to export the entire alumina and aluminium production of NALCO during 1988-89 has jolted the non-ferrous metals trade and industry which has been already reeling under acute supply crunch.

In a telegram sent to the Prime Minister, the President, Bombay Metal Exchange Ltd., Mr. Sevantilal Morakhia, has stated that the Government decision is the result of basically wrong data on crucial parameters.

While there is no objection to the export of alumina, the decision to export aluminium at a time when the country has a backlog of shortage which will reach atleast 40,000 tonnes by the end of 1988-89 as per the estimate of none other than the Minister of Steel and Mines, would ruin small and medium aluminium user industries, he added.

NALCO's actual production during the year has been progressively scaled down from 1,30,000 tonnes to 80,000 tonnes. Besides, MMTC has stopped imports for more than 10 months. This has created an acute short-supply and the entire scenario was brought to the notice of the Minister for Steel and Mines, Mr. Fotedar, during a dialogue with him on May 30, 1988.

Mr. Morakhia appealed for a thorough re-check of the data and review the decision to export aluminium.

FOR YOUR REQUIREMENTS OF

EDTA DI SODIUM SALT  
AMMONIUM THIOCYANATE  
POTASSIUM THIOCYANATE  
SODIUM THIOCYANATE  
AMMONIUM CARBONATE  
ZINC POLY PHOSPHATE  
LEAD ACETATE  
BROMO BENZENE

**GLYCINE USP/BP**  
(Amino Acetic Acid)  
**CALAMINE IP/BP**  
(MFG. FREZCO CORPORATION)

AMMONIUM BROMIDE  
GLYCINE (Pure)  
ACETAMIDE  
ZINC CARBONATE  
SODIUM BROMIDE  
COPPER SULPHATE  
HIPURIC ACID  
LEAD NITRATE

**ETHYLENE THIO UREA-NA 22**

PLEASE CONTACT:

**M/s. PASCO TRADERS**

A, 18, Jay View Co-op. Hsg. Society, Dhake Colony, Andheri (W)  
Bombay-400 058.

Phone Off: 6322847 Resi.: 6493549



## No proposal yet from UC Chembur labour

The Industries Minister, Mr. J. Vengal Rao assured the Lok Sabha that the Centre would sympathetically consider handing over the Chembur unit of Union Carbide to the workers if they formed a co-operative society.

The unit, which produces a vital raw material for the plastic industry, has been closed for about a year, but workers are being paid wages.

Replying to a half-hour discussion on the subject, raised by Mr. Sharad Dighe, Mr. Rao said the workers had neither formed a co-operative society nor forwarded any concrete proposal for takeover.

Replying to persistent demands from members from both sides that the Government either take over the unit or merge it with the public sector Indian Petrochemicals Corporation Ltd. (IPCL), the Minister said IPCL was against this because of its location and the hazardous nature of the unit.

Mr. Rao said even if the Government wanted to take over the unit over, it has to be shifted from Chembur, with the Maharashtra Government having already issued notice for shifting the plant on environmental grounds.

He agreed with members that there is acute shortage of the raw material, low density polyethylene in the country and a large quantity is being imported every year.

On the reported move of the company to sell the plant to a third party, the Minister pointed out that any prospective buyer would have to deposit the necessary money with the court.

Mr. Rao said the Government is considering various suggestions made to revive the unit keeping in view the litigation it is entangled in with Union Carbide at Bhopal.

Members decried the Government's rigid stand on the ground that a tragic incident had already taken place at Bhopal unit of this company.

This is stretching too far. More over the Chembur unit's product mix is entirely different from that of the Bhopal unit, they argued.

With the closure of the Chembur unit, various sugar mills in Maharash-

tra are facing the problem of storing 800,080 tonnes of industrial alcohol which this unit was consuming, they pointed out.

Some members asked why the Minister had sought the opinion of the Attorney General of India for taking over the unit.

Pacifying the members, Mr. Rao said the issue is being examined at length, particularly in the light of the Bhopal litigation.

### METHANOL PROJECT: CHHABRIAS MoU WITH GIIC

The well-known Chhabria group has joined hands with the Gujarat Industrial Investment Corporation (GIIC) for setting up a project to manufacture various grades of methanol.

A memorandum of understanding for setting up the project was signed in Ahmedabad recently by Mr. M. R. Chhabria, Chairman of Chhabria group of companies and Mr. S. K. Shelat, Managing Director of GIIC.

In the course of his one-day visit to Ahmedabad, Mr. Chhabria also signed two other memoranda of understanding. Of these, one was with Gujarat Alkalies and Chemicals Ltd. (GACL), a company promoted by GIIC, for the manufacture of secondary alkyl sulphonates (SAS). The other one was with Gujarat Communications and Electronics Ltd. (GCEL) to participate in Gujarat Data Electronics Ltd.

The Managing Director of GACL, Dr. P. K. Das and the Managing Director of GCEL, Mr. N. Gopalswami, signed the agreement on behalf of their respective companies.

GACL is considering to set up the SAS plant with the collaboration of Hoechst, West Germany. GIIC and the Chhabria group will work together to develop various grades of methanol.

### OIL REFINING CAPACITY TO GO UP ONLY 3.15 M.T. BY '92

The current oil refining capacity in the country is projected to increase by only 3.15 million tonnes by 1992, the Rajya Sabha was informed on Aug. 22nd.

The proposed refining capacity by 1992 is 51.85 million tonnes, as compared to the current refining capacity of 48.70 million tonnes, the Minister for Petroleum, Mr. Brahm Dutt, said in a written answer.

The Minister said the ownership of additional refining capacity would be decided on economic consideration rather than on the interest of oil companies.

Answering another question, the Minister said the Government had approved the formation of a joint venture company with Hindustan Petroleum Corporation and IRIL as co-promoters for setting up the Mangalore refinery.

The initial shareholding by HPCL and IRIL would be 26 per cent each. The balance equity participation would be by the public, including non-resident Indians.

The joint venture company would prepare a detailed project report within 12 months from the date of incorporation of the joint venture and submit the same for Government approval.

He said the decision to go in for a joint venture was made with a view to getting additional resources for the project.

### FLUIDIZED-BED REACTOR FROM BARC

A fluidized-bed reactor system which ensures uniform incineration of wastes at a relatively low temperature in a continuous manner has been designed by the Bhabha Atomic Research Centre (BARC).

Wet polystyrene type ion exchange resins are widely used in nuclear industry, particularly in the primary heat transport (PHT) system of nuclear reactors. Incineration is an effective method to reduce the volume of low active waste materials from such ion exchange systems before the final disposal.

According to a BARC release, trial runs of the incinerator have given encouraging results in respect of both volume reduction and trapping of fine particulate material.

The system consists of the main fluidized-bed reactor connected to an off gas cleaning unit. The facility for close control of temperature in the bed suppresses the escape of waste since it gets fixed in the bed itself.



INTERMEDIATES SUPPLY:

# PSUs seek inputs at global prices

Public sector units are seeking raw materials at international prices in return for supplying intermediates to exporters at global prices against surrender of advance licences.

The proposal to supply intermediates to exporters at world prices is part of a short-term strategy paper prepared by the Commerce Ministry, which was discussed and approved by the Cabinet Committee on Exports held under the chairmanship of the Prime Minister recently.

As per the scheme, public sector units like Indian Oil Corporation, Hindustan Organic Chemicals Ltd. and Steel Authority of India Ltd., would be directed to supply chemical and other raw materials needed by exporters of drugs, dyes, agro-chemicals and plastics. The operational details of the scheme are yet to be worked out.

The idea was first mooted by Mr. Ramu Deora, President of the Federation of Indian Export Organisations (FIEO), who wanted the public sector units to reserve 10 per cent of their production for distribution to exporters at global prices. His proposal envisaged the following steps to compensate the units for supplying material at cheaper prices against surrender of advance licences.

Supplies against advance licences/pass book should be treated as import, attracting no sales tax or octroi levies, or public sector units supplies to ex-

porters should be treated on par with physical exports, involving fiscal benefits under 80 HHC, concessional rate of packing credit, additional licences, CCS and recognition as export/trading house.

However, sources in public sector units said that for the chemical industry, the prime requisite for supply of material at cheaper prices is supply of their feedstocks at international prices. "We cannot sell additional licences at a premium. We should get our feedstock and basic utilities at global prices," they said.

FIEO has requested the Government to expedite the announcement of modalities of the scheme, since five months of the current year had already passed. The scheme should be worked out at the earliest so that the export community could benefit.

As per the July 29 notification, the Government has announced input-output norms for 354 items under Appendix 13C. If the modus operandi of the intermediate supply scheme is announced without delay, the country's export could be lifted to Rs. 20,000 crores as against the estimate of Rs. 18,795 crores.

## PRODUCTION LOSS AT HZL

The Vizag unit of Hindustan Zinc Limited (HZL) incurred a production loss of 5,200 tonnes in the four-month period April-July this year on account

of the 80 per cent power cut imposed by the Andhra Pradesh State Electricity Board. The unit was getting only 4 MW during March 14-July 28 against its requirement of 20 MW

The total domestic production of zinc dropped from 76,366 tonnes in 1986-87 to 60,577 tonnes in 1987-88 because of shortage of power and water. Total imports of the metal by MMTC increased from 42,029 tonnes in 1986-87 to 52,528 tonnes in 1987-88.

The net loss of production of the metal suffered by HZL because of power cut in 1988-89 (upto July 1988) was 2,955 tonnes taking into account the loss which could be offset to some extent by power made available from captive diesel generating sets.

The price of zinc was raised thirteen times during the last three years (September 1986-August 1988).

The value (in crores of rupees) of tin and copper imported by MMTC during 1986-87 and 1987-88 is given below :

Year	Tin	Copper
1986-87	27.38	78.31
1987-88	18.82	215.07

The value of tin and copper produced in the country in the same period is : (Rs. in crores)

Year	Tin	Copper (wire bar)
1986-87	—	102.62
1987-88	.06	129.13

## For Your Requirement of :

HYDROBROMIC ACID  
(48% & 62%)  
HYDROBROMIC GAS  
IN ACETIC ACID  
BROMOBENZENE  
N-PROPYL BROMIDE  
ISOPROPYL BROMIDE

METHYL CHLORO ACETATE  
ISOAMYL BROMIDE  
N-BUTYL BROMIDE  
ETHYL BROMIDE  
CETYL BROMIDE  
LITHIUM BROMIDE  
ISOPROPYL CHLORO ACETATE  
ETHYL CHLORO ACETATE

ISOPROPYL ACETATE  
BENZOYL CHLORIDE  
ACETYL CHLORIDE  
CHLORO ACETYL CHLORIDE  
CAPROIC ANHYDRIDE  
ETHYL FORMATE  
SODIUM BROMIDE  
POTASSIUM BROMATE

Contact Manufacturers :

# SONTARA ORGANO INDUSTRIES

OFFICE :  
3-A Mangaldas Bldg. 2nd Floor,  
R.N. 242, Mangaldas Road,  
Bombay-400 002.  
Phone : 3155681 (O)  
Resl. : 522207, 4123313

FACTORY :

SHED 16, M.I.D.C. CHEMICAL  
ZONE, AMBARNATH 421 501  
Phone : 2483 (F)



Available Regularly :

BUTYL DI GLYCOL

ETHYL DI GLYCOL

METHYL GLYCOL

CETO STEARYL ALCOHOL (HENKEL)

CETYL ALCOHOL (HENKEL)

CYCLOHEXANE

ETHYLENE CHLOROHYDRIN

N/ISO BUTYRIC ACID

KETONIC RESIN SK-100

MONTAN WAX

TERTIARY BUTANOL

THIO UREA

## Chemical Corporation

340/42, Samuel Street, Bombay-3.

Phone : 333601/333602/331738/347262.

REMEMBER US FOR QUALITY, RELIABILITY AND CONSISTANT SUPPLY

AMMONIUM CHLORIDE  
AMMONIUM MOLYBDATE  
SODIUM MOLYBDATE  
MOLYBDIC ACID  
SELENIUM DIOXIDE  
SODIUM CHLORIDE

NICKEL FORMATE  
NICKEL SULPHATE  
NICKEL CARBONATE  
BORIC ACID & BORAX  
SODIUM TUNGSTATE  
TUNGSTIC ACID

ZINC ACETATE  
MANGANESE ACETATE  
COPPER ACETATE/SULPHATE  
EDTA, DI-SODIUM, TETRA-  
SODIUM, FERRIC SODIUM,  
FERRIC AMMONIUM

AND

CARBON BLACK

ZINC SULPHATE

WE CAN OFFER YOU TECHNICAL, L/R, A/R GRADES.  
PLEASE WRITE OR CONTACT :

## Universal Commercial Corporation

413, Commerce House, Nagindas Master Road, Fort, Bombay-400 023.

Phone : 272773.

## BUSINESS OFFER

ALUM PRODUCTION TO ISI STANDARD :

TECHNICAL KNOWHOW, EXPERTISE AND TOTAL SERVICE TO ESTABLISH NEW UNITS OR MODERNISE EXISTING UNITS OFFERED. MARKETING ASSISTANCE IF REQUIRED, CAN BE PROVIDED. PROJECT COST RANGE, RS. 25 TO RS. 75 LAKHS DEPENDING UPON CAPACITY.

Interested Entrepreneurs Contact :

**Box No. 498**  
**Dept. NKM**  
**Madras-600006**



## NRDC awards for inventions

The National Research Development Corporation (NRDC) has announced the 1988 Independence Day awards for innovative inventions under its promotion programme. A total of 19 people share the cash awards amounting to Rs. 6 lakhs and certificates of merit for 10 inventions in key areas of national importance.

The Corporation has also declared the awards of gold and silver medals sponsored by the World Intellectual Property Organisation (WIPO) for 1987 and 1988. While one gold medal has been shared by two, the other gold and silver medals have been awarded individually.

WIPO is one of the specialised agencies of the United Nations and NRDC has been authorised to select suitable inventions for the award.

For the NRDC awards, Mr. Shailendra Sharma, Mr. Ravindra Hirralal Auluck, Mr. E. Hari Babu and Mr. Syed Aslam of Bharat Heavy Electricals Ltd., Hyderabad, have been jointly awarded a sum of Rs. 35,000 for developing erosion-resistant tungsten carbide thermo wells which are used in thermal power boiler furnaces.

These new wells will replace the imported stainless steel ones which wear out very fast because of the high silica and ash content of Indian coal.

Mr. V. K. Bassi of V. Automat and Instruments Pvt. Ltd., New Delhi, has been awarded Rs. 25,000 for the development of a interface level controller used in the separation of crude oil from water. The instruments have been supplied to the Oil and Natural Gas Commission (ONGC) and the Indian Oil Corporation (IOC).

Mr. Nitin S. Mehta and Mr. Madhukar M. Chandekar of Bombay have been jointly awarded Rs. 25,000 for inventing an open width vacuum hydro extractor which is used in the textile industry for the removal of process liquor from wet fabric. Apart from a saving of 40-50 per cent of thermal energy, the device also increases the total production by 30-50 per cent.

Mr. G. Mathiyalagan, Mr. S. Vijayarangam and Mr. S. Ranganathan of BHEL (Tiruchi) get Rs. 10,000 for de-

veloping an improved flame scanner used to monitor the flame in boilers and thus protect furnaces from explosions.

Dr. Vinod Shankar Saxena and Dr. Sarnam Singh Tomar of the Indian Agricultural Research Institute (IARI), New Delhi, have been awarded a certificate of merit for formulating a more effective insecticide for DDT-resistant insects. It contains 25 per cent DDT and an inactive isomer of benzene hexachloride.

Dr. S. Sekar and Mr. A. Marimuthu of BHEL (Ranipet) have also been awarded a certificate of merit for the development of digital on-off controller for electrostatic precipitators used for preventing air pollution from thermal power plants.

The 1988 award of gold medal goes to Mr. Anant B. Marathe and Mr. Balakrishna B. Bapat of Maratha Research Foundation for developing a martex threshold relay. It can be used for the

protection of electrical induction motors from single phasing, electrical or mechanical overload or loose connections. The silver medal has been bagged by Mr. Devendra S. Naik of Surat for an economical jet dyeing machine. It lowers power consumption, utilises less space and reduces operating cost.

### SHRAM AWARDS

The Union Government announced recently the Prime Minister's Shram awards for 1988 to 15 workers including two women in recognition of their outstanding contribution towards production and exemplary zeal and enthusiasm in discharge of their duties.

The Shram Bhushan award has been shared by a team of five workers from the State-owned National Thermal Power Corporation (NTPC) Ramagundam super thermal power project, Andhra Pradesh. They are Mr. K. S. N. Raju, Mr. R. Christopher, Mr. S. V. V. Pulla Rao, Mr. S. C. Raju and Mr. Rajesh Kumar.

The group made significant contributions through innovative ideas in ash

We Offer Yearly Contract For :

PIPERAZINE HYDRATE I.P.  
PIPERAZINE CITRATE I.P.  
PIPERAZINE PHOSPHATE I.P.

Also Available Ready Stock :

IODINE I.P.  
CHLORAMPHENICOL I.P.  
SULFACETAMIDE SOD. I.P.

Manufacturers :

**ISHITA PHARMACEUTICALS**

P. Box 12001, PALDI,

AHMEDABAD-380 007.

Phones : 78560/78218.

Telex : 121-7158 ISHT IN





handling which resulted in tremendous saving.

There is no Shram Ratan award winner this year also.

The Shram Vir award winners are Mr. P. D. Simon from Zircaloy Fabrication Plant in Andhra Pradesh, Mr. K. K. Ponnappan from Hindustan Photo Films, Tamil Nadu, Mr. Kedarnath Choudhury from SAIL, Rourkela and Mr. S. K. Nandi and Mr. G. D. Lohar from Ordnance factory, Maharashtra.

Shram Shri awardees are Mr. S. B. Balasundaram from Hindustan Aeronautics Ltd., Mr. P. A. Thomas from BHEL Hardwar and Deolal Mistry from Karha colliery, Ranchi.

The women recipients of the Shram Devi awards are Mrs. Sheela Mishra of Indian Telephones, Rae Bareilly and Mrs. Raisa Begum of BHEL, Bhopal.

The Government has also announced awards for the best technology development through indigenous research and development efforts and for control of pollution and hazards in the chemical industry.

The Indian Institute of Petroleum, Delhi and Engineers India Ltd., New Delhi will get the first award jointly for excellence in technology development. They developed a process for extraction of aromatics from naphtha streams, a technology being implemented successfully by the refineries.

Indian Petrochemicals Corporation Ltd. (IPCL) will receive the award for control of pollution and hazards in the chemical industry. IPCL achieved 10 spells of more than one million man-hours and one spell of more than three million man-hours without any accident.

The awards were instituted by the Department of Chemicals and Petrochemicals.

#### SLIGHT RISE IN FERTILISER CONSUMPTION LIKELY

Fertiliser consumption this kharif season will be merely 10 to 15 per cent more than during the last kharif, good monsoon this season notwithstanding.

This prediction has been made by

Mr. Pratap Narain, executive director of the Fertiliser Association of India.

Addressing members of the forum at agro-rural media farm in New Delhi recently, Mr. Narain also said that according to his estimate, foodgrains production this year will be 160 million tonnes as against the official target of 166 million tonnes.

He said that the uncertainty on important policy matters with respect to production, marketing and pricing should be avoided in order to ensure rapid growth.

Mr. Narain said that apart from other compelling reasons such as employment and growth, continued thrust on setting up fertiliser capacity within the country besides ensuring the health of existing units, is imperative to prevent difficulties and even exploitation in the international market which may arise due to neglect of Indian agriculture.

#### GSFC RECORDS INCREASE IN OUTPUT SALES

The Gujarat State Fertilizer Co. (GSFC) has recorded a substantial increase in the production and sales of fertilisers and industrial products over the previous year.

A review of GSFC's current year's overall performance during the first seven months has indicated that the production of fertilisers has been 6,57,040 tonnes as against 4,44,440 tonnes in the previous year, registering an increase of 48 per cent.

Similarly, the off-take of fertilisers has also recorded a substantial increase of 114.74 per cent with 4,15,310 tonnes of sales for the current year as against 1,93,397 tonnes of the corresponding period of last year.

GSFC's fertiliser production target for the 12-month period of the current year has been set at 10 lakhs tonnes with a matching sales target. The current year's bright agricultural prospects due to good monsoon will give a boost to fertiliser off-take and the company expects to distribute the entire production during the kharif and rabi seasons.

The performance in respect of the industrial products has also been equally impressive. Caprolactum production has shown an increase of 47 per cent with 11,800 tonnes as against 8,000 tonnes during the previous year.

**NOW AVAILABLE  
AT VERY COMPETITIVE RATES  
AND  
IN BULK QUANTITIES.**

- ★ Sodium Chloride I.P./A.R.
- ★ Potassium Chloride I.P./A.R.
- ★ Sodium Lactate 60% U.S.P.
- ★ Sodium Acetate I.P./A.R.
- ★ Sodium Citrate I.P./A.R.

Manufacturer :

**Denis Chem Lab Ltd.**

Chhatral,  
Tal. Kalol (N. G.),  
Dist. Mehsana,  
GUJARAT-382 729.

Phones : (02764) 2027 2127



For Your Requirements Of :

**Etofylline I. P.**  
**Caffeine I. P.**  
**Mefenamic Acid B.P.**

Also Available :

EPHEDRINE HCL  
LACTIC ACID  
CALCIUM LACTATE  
SODIUM LACTATE

PARACETAMOL  
LIGNOCAINE HCL  
MALT EXTRACT  
MAGNESIUM TRISILICATE

ALUMINIUM CHLORIDE  
LITHIUM CHLORIDE  
LITHIUM CARBONATE  
SFS

Please Contact :

**DIVYA CHEMICALS**

Room No. 8, 'C' Block, 2nd Floor, Bhangwadi, Kalbadevi Road, Bombay-2.  
Phone: 311199/253616/297052/310112 Gram: DIVYACHEM Bombay-2.

Wanted transport contractor with lead lined  
Tanker of capacity 4-6 tonnes for  
Transporting liquid chemicals on  
Long term contract basis

Write to :

**BOX NO. 2241**

C/o. CHEMICAL WEEKLY

306, Shri Hanuman Industrial Estate,  
G. D. Ambekar Road, Wadala, Bombay-400 031.

**Milestone Industries**

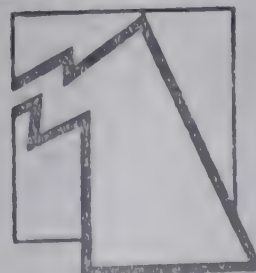
1013-14, Phase-IV G.I.D.C. Estate, Naroda 382 330  
Phone : 810560, 812543. Gram : Mileston

**milestone**

**IRON POWDER**

(REDUCTION GRADE)

**milestone**





## Duty cut to cost Rs. 200 cr.

The Union Government would be losing an estimated Rs. 200 crores in a year, following its decision to reduce the import duty on machinery and equipment for electric power generation for captive use by industries.

There is, however, no firm estimate of the revenue loss on account of the duty reduction, as this would depend on the number of units setting up imported captive power plants after being encouraged by the duty relief.

A recent notification had fixed the new import duties at 35 per cent ad valorem on generating sets of capacity ranging between 2.5 mw and 50 mw and 25 per cent ad valorem on sets of capacity above 50 mw. Earlier, the duty on all such captive diesel generating sets was 35 per cent, if these were imported by industry.

According to the Government, even though revenue loss may be a substantial amount, the concession would go a long way in overcoming the shortage of power for industrial production. Industry had all along been clamouring that power shortage is affecting its production and it could not import generating sets at reasonable prices, as the duties are high. There is also a shortage of indigenously available generating sets, it is stated.

The Government notification, which was issued in response to this plea of industry, would be valid up to March

31, 1989. The reduced duty would not be applicable only when the sets use fuel other than low sulphur heavy stock or heavy petroleum stock and when the sets are imported as part of a project. The project import duty rates for such generating sets are different.

Imports of such sets on reduced duty would also have to produce necessary certificates from the Directorate General of Technical Development (DGTD) or from the Commissioner of Industries of the State Government concerned.

### BINNY TO PLAY ACTIVE ROLE IN WIND MILLS PROJECT

Binny Engineers Ltd. will be actively involved in a Rs. 10-crore project proposed to be set up in Tamil Nadu by a Delhi-based company to manufacture wind mills with Danish technology.

The project, likely to be located near Madras, is being established by Vestas RRB India Ltd., a venture promoted by RRB Consultants and Engineers Ltd. in collaboration with Vestas Wind Systems, Denmark, a world leader in the field.

Mr. Rakesh Bakshi, Managing Director of RRB group told newsmen that Binny Engineering will supply on a long-term basis (20 years) 60 per cent of the wind mill machine components

and fabricated steel parts for the project.

This will prove a major diversification for the engineering division as it will get orders to the tune of Rs. 6 lakhs in the manufacture at a cost of 12 lakhs.

The company has plans to manufacture in a year 100 wind mills each of 100 KW and another 100 units each of 200 KW. In the first year, it intends to make 50 units. The Danish company is providing 25 per cent equity capital.

The production will commence within a period of 12 months. The manufacture of turbines falls under de-licensed category and the Government is expected to clear the foreign collaboration within a month.

Mr. Bakshi said the company will seriously pursue the indigenisation programme and the content is expected to be 80 per cent in the second year of operation. There is also a proposal to establish wind parks in the States of Tamil Nadu, Andhra Pradesh and Gujarat.

He said Vestas, is the largest manufacturer of wind turbines with proven technology and more than 3000 units are installed in over 10 countries.

RRB is also active in the field of non-conventional energy sources and has commissioned on a turn-key basis Vestas wind electric generators (55 kw to 90 kw capacity each) in States like Tamil Nadu, Maharashtra, Gujarat, Orissa and Madhya Pradesh.

For Your Regular Requirements Of :

AMMONIUM BICARBONATE (MANGALA)  
BLEACHING POWDER (MODI & METTURI)  
SULPHATE OF ALUMINA (AAC)  
CAUSTIC SODA FLAKES & SOLID  
SODIUM THIOSULPHATE (HYPO)  
SODIUM BISULPHITE & SULPHITE  
SODIUM NITRITE & NITRATE  
SODIUM METASILICATE (KAILASH)  
SODIUM SULPHIDE FLAKE & CHIPS  
SODIUM SULPHATE (GOLDEN)  
SODIUM ACETATE (CAP)  
SODIUM FORMATE (KUMAR)

OXALIC ACID (EXCEL & KUMAR)  
TRISODIUM PHOSPHATE (IRE)  
BORIC ACID POWDER  
SODA ASH & R. B.  
CITRIC ACID (COMMERCIAL & CITURGIA)  
ACETIC ACID (TDC)  
DI-AMMONIUM PHOSPHATE  
TITANIUM DIOXIDE  
HYDRO SULPHITE OF SODA  
SOLVENT DEG.  
BORAX (GRANULAR & CRYSTALS)  
AND ALL INDL. CHEMICALS.

Please Contact :

**M/s. MADANRAJ KHICHA**

(ESTD. 1963)

No. 86, Govindappa Naick Street,  
MADRAS-600 001.

Gram : SESHMADAN

Phone Office : 561850 563381

Resl. : 518263/515108.



## COMPANY NOTES

### FACT SETS NEW RECORDS

The Fertilisers and Chemicals Travancore Limited (FACT) continued to maintain its good performance in production in July. FACT, which had exceeded its production targets during the first quarter, exceeded its production targets for nutrient Nitrogen and nutrient  $P_2O_5$ . The production of nutrient Nitrogen was 23,258 tonnes against the target 21,988 tonnes improving upon the targets by 5.7 per cent. In respect of nutrient  $P_2O_5$  the production of 12,273 tonnes was 26.25 per cent higher than the target of 9,720 tonnes.

Total production of fertilisers during the four months of the current financial year ending July 31,

was 3,25,768 tonnes which had shown an increase of 34 per cent over the total production of 242,862 tonnes during the corresponding period last year. The sulphuric acid plant of Cochin division of FACT registered a record monthly production of 30,650 tonnes in July improving the previous best of 29,955 tonnes in October 1985.

FACT maintained its good sales performance of the first quarter by achieving a sales of 1.10 lakh tonnes of fertilisers in July against the month's target of 1.01 lakh tonnes, i.e., an achievement of 109 per cent of the target. The sales for the period April-July is 3.3 lakh tonnes against the target of 2.68 lakh tonnes — an increase of 25 per cent.

### GAL TO MERGE WITH ATUL

The Gujarat Aromatics Ltd. (GAL), a sick unit of the Gujarat Industrial Investment Corporation (GCCI) in joint sector, would soon amalgamate with the Atul Products Ltd. of Lalbhai group saving about 300 persons from losing their jobs.

GAL had been incurring losses due to lack of demand for its main product mix cresols. Atul has planned new product-line to increase the plant's capacity utilisation.

Atul's own performance during the first six months was better than the corresponding period last year. Its cumulative sales increased from Rs. 36.63 crores to Rs. 57.24 crores while profits before depreciation increased from Rs. 0.72 crore to Rs. 4.06 crores, a company release said.

ASSURED RELIABLE SUPPLY

## Chalthan Acetone

Non Toxic-Pharmaceutical Grade  
Available in Ready Stock  
in Tanker-Drum Load

PLEASE CONTACT FOR YOUR REQUIREMENT :

### CHALTHAN SUGAR FACTORY

POST : CHALTHAN 394 305

DIST. SURAT (GUJARAT)

Grams: KHANDUDYOG SURAT

Phone: Surat - 38206/26233



## Gujarat State Fertiliser Company

A handsome dividend amount of Rs. 3.82 crores has been given by the Gujarat State Fertilizers Company to the Gujarat Government for the year 1987 on its investment in the Company's equity share capital. This dividend disbursement gave a return of 87% on the Government's original investment in the equity of Rs. 4.41 crores in GSFC. At the present stock market prices of Rs. 121 per GSFC share, the value of this investment stood at Rs. 154.18 crores which was almost 35 times of the value of original equity investment. GSFC's Chairman Mr. H. R. Patankar accompanied by the Managing Director Mr. P. V. Swaminathan presented a cheque for the dividend

amount to the Chief Minister Mr. Amarshinh Chowdhary at Gandhinagar on July 4. GSFC's Chief Financial Controller Mr. P. V. Joshi was also present on this occasion. GSFC has been regularly paying dividend to the State Government for the last nineteen years and it had so far given an amount of Rs. 30.26 crores to the State Government by way of dividend on its equity and preference shares.

The State Government's investment in GSFC has been most rewarding. In the Company's total equity capital of about Rs. 9 crores, the State Government's original share was Rs. 4.41 crores. With the four bonus issues the Government's original investment

of Rs. 4.41 crores rose to Rs. 12.74 crores.

From a small fertilizer unit GSFC has today grown into a monolith of multi-plants, multi-products, multi-technologies and multi-locational complex with an excellent productivity record and a strong financial base and it was for this reason that the Company could weather the last three years' severe drought situation coupled with glut and other bottlenecks and turned out good results for the year 1987 through diversification and judicious corporate management. The dividend was raised to 30% from 27% on the enlarged capital after 3:10 bonus issue which was the highest in the fertilizer industry. The Company's gross block increased to Rs. 314.79 crores from Rs. 260.35 crores and the earning per share went up from Rs. 11.09 to Rs. 13.07 on increased capital.

The Chief Minister was informed that looking to the present indications, GSFC was expected to do better during the current year. The tempo of production and sales had been sustained during the first half of the year. The total production of the fertilizers was substantially higher at over 5.75 lac MT as against 3.74 lac MT of the corresponding period. Similarly the sale of 1.98 lac MT of fertilizer was higher than 1.64 lac MT of the corresponding period. The production and sale of industrial products such as Caprolactam, Nylon-6, Melamine and Argon also registered an upward trend.

The Chief Minister was happy to know that the Company was fully geared to implement the corporate growth plan covering 50,000 TPA capacity Caprolac-

when you think of

# MINT FLAVOUR



COME TO

*Bhagat Fine Chemicals*

164, Sitaram Poddar Marg, Bombay 400 002, India,  
Phone: Off. 316928-310878. Gram: PUREPUDINA

WELKNOWN FOR

*Bhagat's* **LAXMI**

**MENTHOL CRYSTALS &  
CUSTOM MADE MINT OIL VARIETIES**

"FOR FLAVOURS AND PHARMACEUTICALS"

Also available specialities like Terpenes, Menthone Menthyl  
Acetate, Exmint Oil



expansion, 40 MW capacity generation of steam and power project, 10,000 TPA capacity Melamine expansion and 1350 D Ammonia plant. The Company also intends to participate in the Gujarat Petrochemical complex at Hajira. All these projects would require a total funding of Rs. 1000 crores of which an outlay of Rs. 400 crores has been earmarked for the first phase. The Company is shortly entering the share market with a convertible debenture right issue of Rs. 150 crores.

## NATIONAL PEROXIDE

Labour unrest and glut of hydrogen peroxide (HP) in the open market have continued to affect the working of National Peroxide adversely in the current year also.

Disclosing this at the annual general meeting of the company, the chairman, Mr. Neville N. Wadia said that workers strike, which began in January, 1988, lasted till the first week of May this year and normal production of HP commenced from the middle of June, 1988. As a result, the company produced only 700 tonnes of HP till July-end and sold 260 tonnes. Sales have been lower, mainly due to glut of nearly 1,500 tonnes of imported HP in the market. It is hoped that the company's sales will improve, once the stocks of imported HP is reduced.

Mr. Wadia added that in view of above circumstances, sales during the first four months of the current year are substantially lower at Rs. 1.38 crores against Rs. 4.60 crores in the same period last year.

The company's plastics additives project is now complete and has already commenced trial runs. This project has a bright future since the demand for plastics additives has been on the rise in the country. This item is being used in the manufacture of various grades of PVC. The company will have no difficulty in selling the entire production of plastics additives. When in full production, the annual turnover of this division will be around Rs. 25 crores.

## RANBAXY LABORATORIES

Ranbaxy Laboratories Ltd. has been awarded the Trishul Award of the Basic Chemicals, Pharmaceuticals and Cosmetics Export Promotion Council for the year 1986-87. The company had bagged the top award for export of

drugs and pharmaceuticals in 1985-86.

Ranbaxy exports both basic drugs and pharmaceutical formulations to over 30 countries. The major markets are western Europe, south-east Asia, Far East, Gulf countries and Africa.

The company's export during 1987 accounted for Rs. 17.47 crores showing a 64 per cent rise over the previous year. Export of the company upto July in the current year amounted to Rs. 12.55 crores. The company hopes to achieve an export target of Rs. 25 crores in the current year.

Ranbaxy has been successfully operating joint ventures in Nigeria, Malaysia and Thailand with marketing tie-up and licensing arrangements for active brand promotion of its products in Cameroon, Oman, Sri Lanka and UAE.

Any Problems In  
TEMPERATURE MEASUREMENT?  
Always Insist on



MERCURY-in-STEEL DIAL  
THERMOMETERS  
BI-METAL DIAL THERMOMETERS  
ASTM/IP STANDARD GLASS  
THERMOMETERS

**M/s. KALIDAS HARJIVAN**

(Estd : 1920)

195, Samuel Street, Bombay-400 009

Phones : Office : 8555525, 321882 Resl.. 8120548

Grams: MAHUVAWALA



## BERGER PAINTS

Berger Paints India Ltd., which has recommended one for one bonus issue, has reconstituted its board of directors. Mr. Biji Kurien, the chief executive of the company has been inducted in the new board as Managing Director with effect from September 1. The other new entrant is Mr. S. K. Mitra, partner of a solicitor firm in Calcutta. The board of directors led by Mr. Vijay Mallya will have two old faces: Mr. Brian P. Davis and Mr. Barry A. Tata. Those who have been dropped from the previous board include Mr. C.L. Jain, Dr. E. Belatin and Mr. H.P. Bhagat.

The board has also declared a dividend of 20 per cent for the year ending June 30, 1988. It has also recommended that the company may make a rights-public issue of 12.75 lakhs shares of Rs. 10 each, at a premium of Rs. 35 per share to augment the working capital of the company and normal capital expenditure. Berger Paints last equity issue was a similar rights-cum-public issue of 2.62 lakhs equity shares in 1975. After the bonus issues and the rights-cum-public issue have been completed, over 40 per cent of the company's paid-up capital would be out of bonus issue.

The 65-year old company, was set up initially in 1923 as Hadfield India Ltd. It changed its name to British Paints India Ltd. in 1947, when it was acquired by British Paints (Holdings) Ltd. of the UK starting with a 100 people and a sale of Rs. 25 lakhs. Berger Paints India now has 1,100 strong workforce with a turnover of Rs. 77.13 crores,

from the sale of 22,000 tonnes of paints.

During the year, the Hoechst Group sold the worldwide Berger Jenson and Nicholson Group of Paint Companies to Williams Holdings PLC of the UK for a consideration in excess of £130 million. This was a strategic acquisition for Williams who already owned Crown Paints, a major solidation of Crown and Berger operations in the U.K. there will considerably strengthen Williams position in the paint industry in the UK.

Williams in turn, sold the Pacific basin interests of Berger (Australia, New Zealand, Fiji) to the ICI group. The African, Mediterranean, Middle Eastern, Asian and Far Eastern interests were acquired by the Consolidated Paints Group of the UK. The consolidated Paints group have assured Berger Paints India of technological and marketing support and have expressed a firm commitment to India.

Berger Paints India has registered a marked growth in sales turnover from 68.89 crores in 1986-87 to Rs. 77.13 crores in 1987-88. After depreciation and taxation the profit stood at Rs. 1.79 crores against previous year's 1.92 crores. Including surplus brought forward, profit available for disposal stood at Rs. 2.56 crores, against Rs. 2.90 crores in 1986-87.

An amount of Rs. 13,622,820 being part of the undistributed profits will be used for paying 1,362,282 ordinary shares of Rs. 10 each to be allotted as fully paid bonus shares.

The board proposed 1,275,436 new shares of Rs. 10 each to be offered for subscription for cash at a premium of Rs. 35 per share in the following manner: (1)

272,456 ordinary shares to the existing members in the ratio of one new ordinary share for every 10 existing ordinary shares held by the members whose names appear in the register of members of the company on such date as may be determined by the board; (2) 63,772 ordinary shares to be offered for subscription to employees of the company; (3) 127,544 ordinary shares will be offered for subscription to various business associates of the company who are resident Indians and (4) 811,664 ordinary shares will be offered for subscription to members of public.

## COLOUR-CHEM LTD.

Mr. B. M. Ghia, Chairman, Colour-Chem Ltd., told the shareholders in Bombay recently that the company's output of textile and leather auxiliaries had to be curtailed in the recent months due to non-availability of acrylic monomers and due to high prices of a few other essential inputs.

Because of this, the company's operations during April-July 1988 have been under pressure although a marginal increase in sales was achieved as compared to sales achieved in the same period of last year.

Mr. Ghia said that profits of dyestuff manufacturers in the organised sector continued to remain slim due to unfair competition from excise-exempted output by the small scale sector.

The recent decision of the government to reduce the all-industry rate of duty drawback to 5 per cent from 10 per cent would further erode the already uneconomic return on the capital employed in the dyestuff industry and would be a severe blow to export effort, he added.



FOR YOUR REQUIREMENTS OF

## SODIUM LAURYL SULPHATE

30% LIQUID & 90% POWDER

## SODIUM LAURYL ETHER SULPHATE

30% LIQUID

TOOTHPASTE, COSMETIC, PHARMACEUTICALS  
& DETERGENT INDUSTRIES

CONTACT MANUFACTURERS

## INTERMEDIATES & CHEMICALS

S-77/1, M.I.D.C., BHOSARI, PUNE - 411 026

PHONE: 87476

NO DELAY -- PROMPT DELIVERIES

## ALUMINIUM CHLORIDE ANHYDROUS

MANUFACTURERS:

### ARONI CHEMICALS

(PROP. ARONI COMMERCIAL COMPANY LTD.)

#### REGD. OFFICE

29, Bank Street, 1st Floor

Fort, Bombay - 400 023

Phone: 2862453/2863021

Gram: METALDIST

Tlx: 011-6554 MINA IN

#### REGIONAL OFFICE

38, Urmi Society,

Productivity Road

Baroda - 5.

Phone: 325953

#### WORKS

Birlagram

Nagda (M.P.)

PIN. 456 331

Phone: 104/283

Gram: NIYATI

Manufacturers of:

■ Benzoyl Peroxide

(Powder & Paste form)

■ Methyl Ethyl  
Ketone Peroxide

■ Tertiary Butyl  
Hydro Peroxide

■ Lauroyl Peroxide

■ Tertiary Butyl  
Per Benzoate

■ Di-Tertiary Butyl  
Peroxide

■ Cyclohexanone  
Peroxide

**Five Stars**

ENGG.

103, Narayan Dhuru Street, 3rd Floor, Bombay-400 003  
☎ 329209, 329313. Telex: 11-73341 VMKA IN.



PROPYLENE GLYCOL USP  
EPICHLOROHYDRINE  
PARAFORMALDEHYDE

91 & 96%

TWEEN-60

HYFLOSUPERCELL - USA

P.E.G. 4000 & 6000

STYRENE MONOMER

ROSE CRYSTAL

ISOPROPYL CHLORO

ACETATE

GLYCERINE USP

LACTOSE IP/BP

TITANIUM DIOXIDE RCR2

BUTYL CELLOSOLVE

N. BUTANOL

DIMETHYL SULPHOXIDE

METHYLENE CHLORIDE

PARA CRESYL PHENYL

ACETATE

METHYL CHLORO ACETATE

MANNITOL USP

MELAMINE

PHENOL USP

CYCLOHEXANONE

TUNG OIL - CHINESE

DIMETHYL FORMAMIDE

SOYA LECITHIN

CYANAMIC ACID

TRICHLORO ETHYLENE

PARA CRESOL

METRONIDAZOLE

POLYESTER RESIN

(All grades)

ORTHO NITRO BENZENE

FUROZOLIDONE

PHENOBARBITONE

GLYOXAL

OFFERING FROM READY  
STOCK THROUGH EXPORT  
HOUSE

## CHEMO INDIA

24, Jambulwadi, Room No. 47,  
1st Floor, Dhobitalao,  
Bombay 400 002.

Tel.: 313412/258974/316166

Gram: SOLVCHEM

Telex: 011-6134 KEMO IN

**A NEW NAME**  
**TO MEET YOUR REQUIREMENTS OF**  
**SEQUESTERING / CHELATING AGENTS**

# EDTA

EDTA PURE ACID

EDTA TETRA SOLUTION

EDTA DI SODIUM

EDTA-FERRIC SODIUM

EDTA TETRA SODIUM EDTA FERRIC AMMONIUM

MICRONUTRIENTS -- Zn, Fe, Cu & Mn EDTA

Contact Manufacturers:

*New Alliance Dye Chem. Pvt. Ltd.*



Office:

214, Bazar Ward, Kurla West,  
Bombay 400 070.

Phones: 5123983-5112465

Factory:

K-63, M.I.D.C. Tarapur,  
Post-Boisar, Dt. Thane

Pin: 401506

For your Requirements of:

**ACETATE □ CARBONATE**  
**CHLORIDE □ CHROMATE □ DIOXIDE**  
**HYDROXIDE □ NITRATE □ OXIDE □ PHOSPHATE**  
**SULPHATE Etc.**

— OF —

**CADMIUM □ COBALT**  
**COPPER □ LEAD □ NICKEL**  
**MERCURY □ STANNOUS (TIN-II) □ ZINC**  
**AND OTHER INORGANIC CHEMICALS**

**AMMONIUM BI CHROMATE TECH, PURE & EXTRA PURE**  
**POTASSIUM BI CHROMATE A.R. AND**  
**POTASSIUM CHROMATE.**



## ACE CHEMICALS

Bombay Sales Office:

A-1, Sahyadri, Pandurang Wadi,  
Goregaon (East), Bombay-400 063.  
Tel. 6882232 □ 6882614

Regd. Office & Factory:

Plot No. N-11, M.I.D.C.  
KUPWAD-416 425  
Dist Sangli, (Maharashtra).



## New Plants & Products

### NEW RECYCLING PLANT FOR SPENT REFORMING CATALYSTS

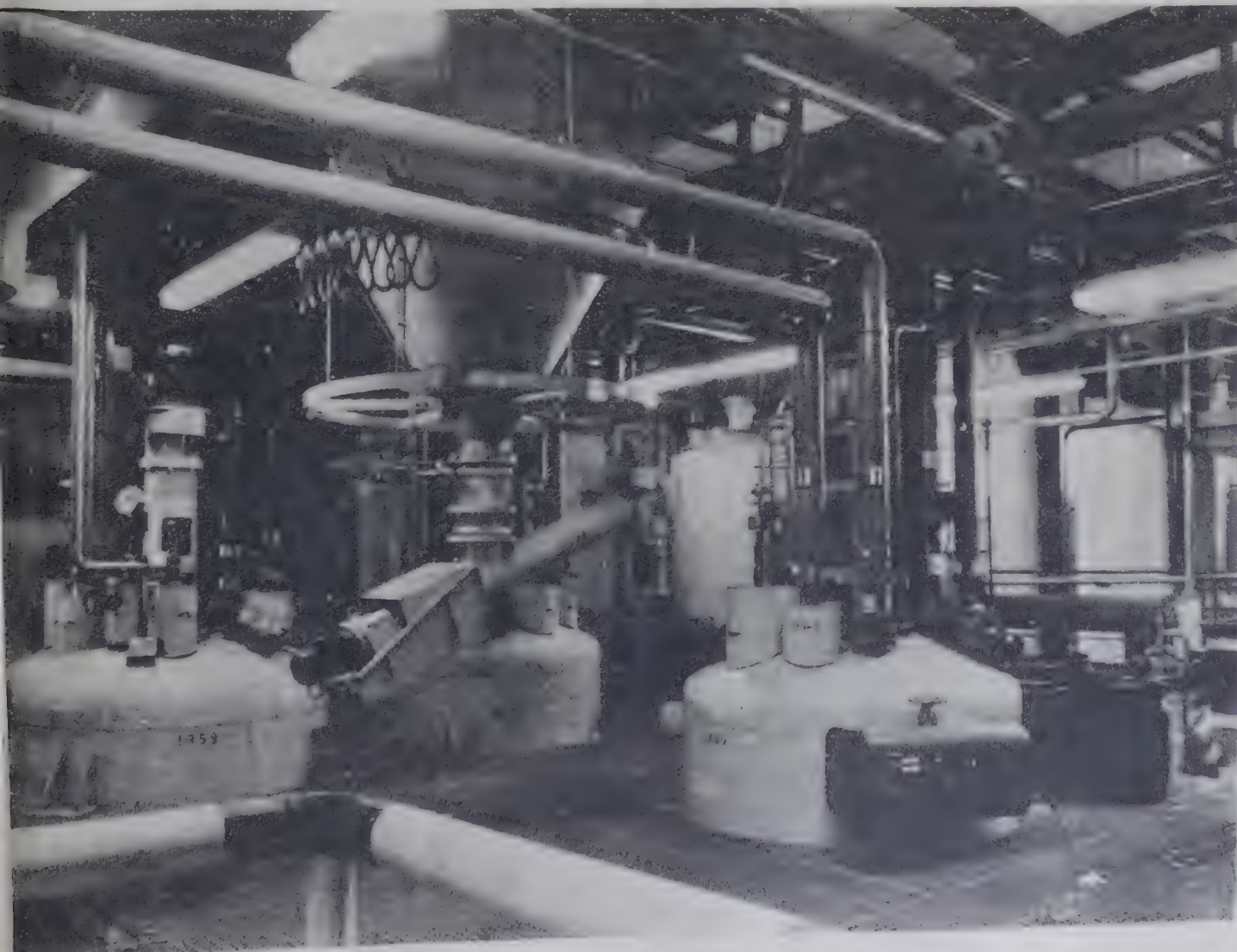
In the spring of 1988, Degussa AG Frankfurt am Main put a new recycling plant for spent reforming catalysts from mineral oil refineries into operation at its metal works in Hanau-Wolfgang, West Germany. The complex recycling process for the recovery of the precious metals contained in the catalysts, in particular the platinum, has been applied by the company since 1960. Numerous detailed improvements have optimised results and capacity has now been expanded to 80 metric tonnes per month.

The plant and safety equipment are to a large extent process-controlled. The concentrated caustic soda solution used during recycling makes extensive labour and environmental protection measures necessary. No waste fluid is produced by the process: the resulting aluminate liquor is used to the aluminium industry for further processing. Energy is supplied mainly in the form of steam, generated at the plant by the incineration of photographic paper and film, for example, which pass through another section for the recovery of silver.

The recycling process consists

basically of three phases. Firstly, samples of the catalyst are examined to determine the precise precious metal contents, so that the customer's account can be based on accurate analytical data. The second phase involves processing of the catalyst, during which the accompanying substances -- mainly aluminium oxide and various impurities -- are separated off. In the third phase, the accumulated precious metal is separated and purified to a quality suitable for the production of new catalysts or other products.

During the pre-treatment, the material is weighed accurately and



Pressure autoclaves in the new recycling plant for spent reforming catalysts at Degussa's metal works in Hanau-Wolfgang.



then screened to separate the main catalyst fraction from dust containing a high level of precious metals and coarse particles with no precious-metal content. The exact precious-metal contents of the samples which remain after the homogenisation are then determined in an analytical process.

In the second phase -- the recycling -- any carbon which may be present is removed from the catalyst by burning up. The spent catalyst is treated with caustic soda solution at a pressure of approximately 10 bar and a temperature of approximately 200°C. Under these conditions the base material -- alumina -- is converted into sodium aluminate, which is decanted from the residual matter. These residues contain the platinum and, in some cases, iridium as well. The platinum metals are dissolved in hydrochloric acid with chlorine and then delivered up as solution to the platinum refinery for further processing.

The platinum purification up to 99.95% minimum is one of the most difficult tasks in inorganic chemistry. The main problem is that the applied separating procedures are not quantitative, so that traces of the platinum metals remain in the mother liquors, remained after each crystallization process. As a result, all the mother liquors must also be recycled in order to achieve satisfactory overall yields.

Reforming catalysts are used by the petrochemical industry in mineral oil refining processes. Natural mineral oils contain little or none of the anti-knock benzene which is required, for example, in high-quality fuels with high octane numbers. In the reforming process, the basis principle of which has been applied on a large technical scale since the end of the nineteen-forties, highly knock-resistant hydrocarbons are

produced. The catalysts used in the process are small compacts or other shaped pieces of alumina, coated in most cases with platinum. When the catalyst loses its effectiveness after several years, it must be renewed.

The 25,000-metric ton total mass of catalysts used by approximately 500 reforming plant operators throughout the world contain about 95 metric tons of platinum and 1.5 metric tons of iridium. Approximately 4,000 metric tons of spent catalysts are available for recycling every year. Depending on the quality of the catalysts, the recovery rate at Degussa ranges from 97 to 99% of the platinum content determined by sample analysis. The fact that only 1% of the yearly world's platinum production goes into the petrochemical industry indicates how complete the platinum cycle is in this particular area.

#### **HIGH-PRESSURE STEAM SUPERHEATER IMPROVES ECONOMIC PERFORMANCE OF AMMONIA PRODUCTION PROCESS**

The high-pressure steam superheater developed by Sulzer has proved to be extremely useful in the large scale production of ammonia.



Assembly of the superheater

Such a superheater, installed in a 1000 tonnes per day production plant in Canada, has been in operation since 1983, often at 120% of the design rating. On account of this good result, the production plant has now been supplied with an additional heat exchanger bundle. Moreover, during the next standstill, Sulzer is to carry out a residual life analysis on the first superheater bundle.

Ammonia is produced in large single-line plants (500 to 1500 tonnes per day). Costs of the feedstock materials required for the production, e.g. natural gas, are continually rising, hence the trend to develop new plants with higher efficiencies. Such plants require a superheater between the secondary reformer and the high-temperature CO converter. The high-pressure steam superheater consists essentially of many parallel, helical-line tubes and a two-part pressure casing. It cools the gases flowing out of the secondary reformer from 705°C to 371°C at 34 bar inlet pressure. The steam temperatures are 328°C at the inlet (125 bar inlet pressure) and 451°C at the outlet. The amount of thermal energy recovered is such that a significant reduction of the operating costs is obtained.

Further information can be had from Sulzer, CH-8401, Winterthur, Switzerland.

#### **ESCHER WYSS FLUID-BED DRIER WITH IMPROVED ECONOMIC PERFORMANCE AND FLUID-BED TECHNOLOGY**

Sulzer Escher Wyss, Zurich and Ravensburg, have made an important contribution to improving the economics of drying processes by further development of the fluid-bed drier. The new drying procedure allows the transfer of large quantities of heat even at low temperatures and using the smallest possible



quantities of carrier gas. Moreover, and practically as loss-free change reaction, it allows the operation of closed systems using the evaporated product vapour as fluidizing gas. In addition to the absolute minimalization of the heat consumption, the inert and emission-free nature of the operating mode is further evidence of its exceptional value. Moreover, almost the whole of the energy used for the drying can be utilized further as waste steam.

In order to make this system widely applicable, further developments have been made in the granulation and structurizing of product forms not immediately fluidizable, such as sludges, pastes, suspensions and filter cakes.

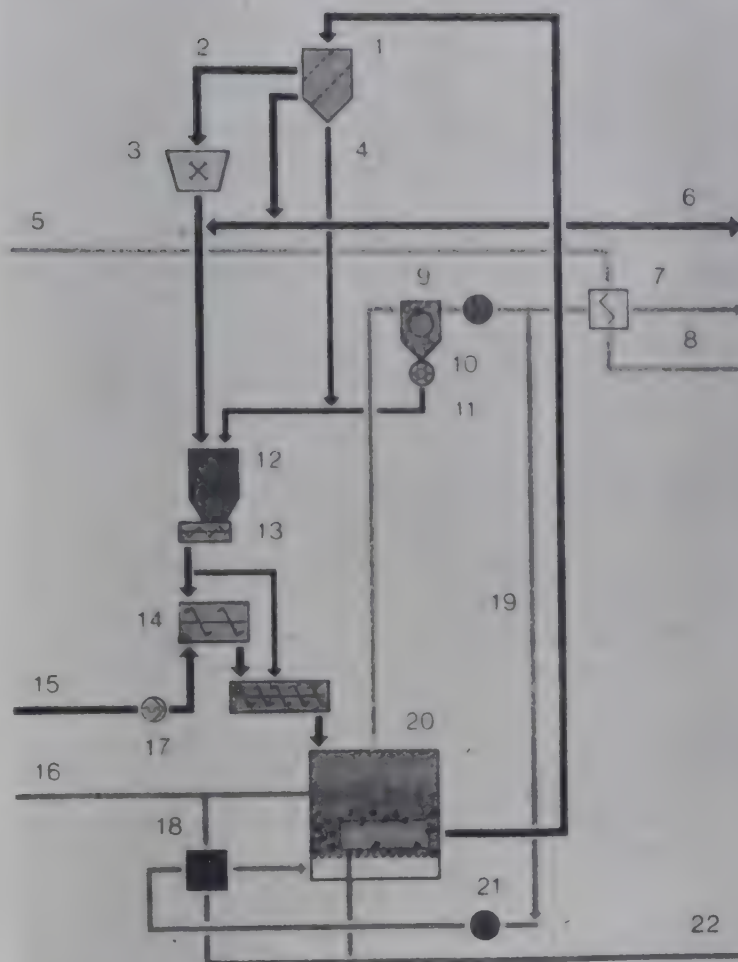
Fluid-bed driers achieve transfer of the heat or material required for drying substances in bulk by enforced convection. This is the most frequent functional principle also for drum-, flash- and spray-driers. All variants have nevertheless to take into account the fact that the drying, as a rule, accomplished at the price of more or less high losses by convection.

Further details can be had from Sulzer-Escher Wyss AG, Postfach, CH-8023, Zurich, Switzerland.

## WATER-COOLED GAS COMPRESSOR OF TRUNK-PISTON DESIGN

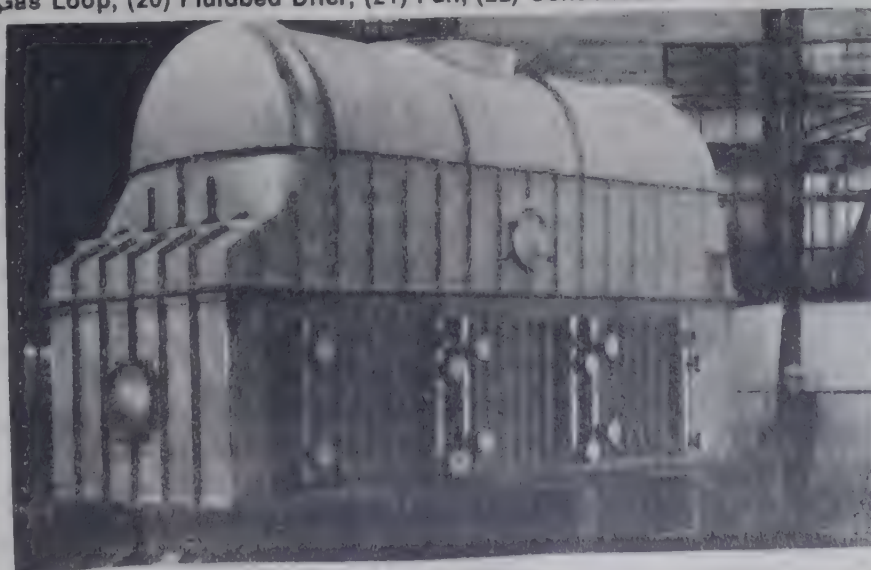
Sulzer-Burckhardt, Basle, has recently published a six-page folder brochure entitled "CT -- The trend-setting, water-cooled gas compressor of trunk-piston design".

The brochure commences by describing the special features and typical application areas of these compressors (suction capacity 270-180 m<sup>3</sup>/h, discharge pressure 25 to



Granulation of paste products and drying of same using heat-exchanger fluid-bed equipment in a closed gas circuit.

(1) Screen, (2) Oversize, (3) Grinder, (4) Undersize, (5) Cooling Media, (6) Final Product, (7) Condenser, (8) Condensate, (9) Cyclone, (10) Rotary Valve, (11) Dust, (12) Silo, (13) Metering, (14) Granulator, (15) Paste, (16) Steam, (17) Metering, (18) Heat Exchanger, (19) Gas Loop, (20) Fluidbed Drier, (21) Fan, (22) Condensate.



Fluid-bed equipment



300 bar, power input ca. 40 to 130 kW). Information concerning design and materials is provided, as well as details of standard scope of supply, options and instrumentation. Finally, production, quality assurance, research and development, testing and customer support service are briefly outlined.

The brochure is available, free of charge, from: Sulzer-Burckhardt, Engineering Works Ltd., Dornacherstrasse 210, CH-4002, Basle, Switzerland.

### LOW TEMPERATURE DRYING SYSTEMS

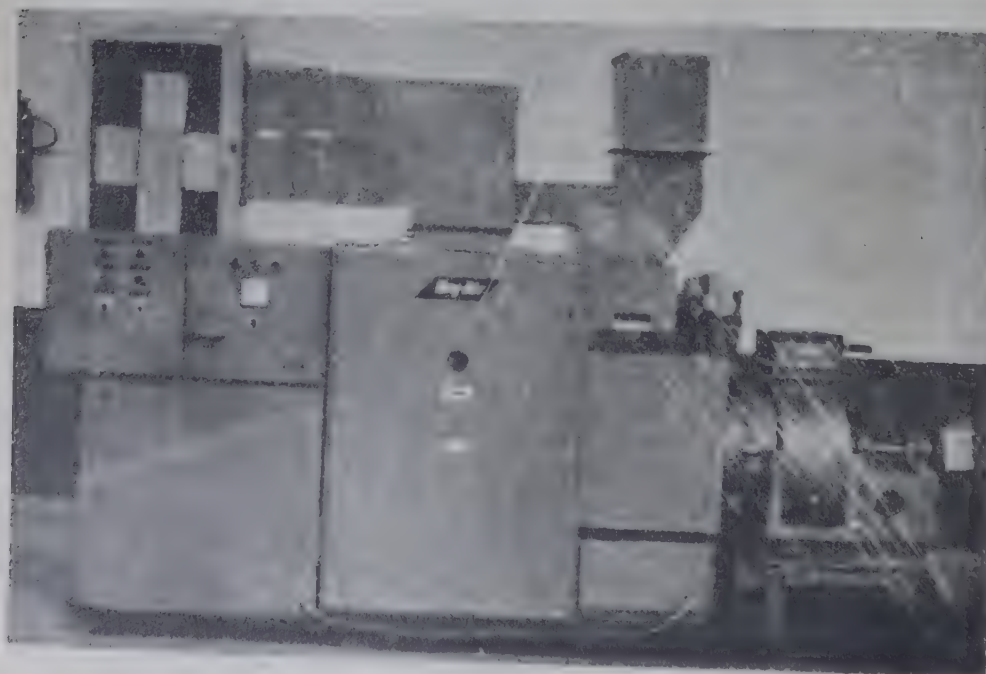
For products which are temperature sensitive, drying at high temperature deteriorates their quality. In such instances, the solution lies in surrounding the product with dry air without the risk of product spoilage. Bry-Air specializes in such types of low temperature drying at temperature below 75°F. Bry-Air dehumidifiers speed up product drying by continuously removing moisture from the surrounding air by a process of physical adsorption where the adsorbent used is a desiccant.

Bry-Air units are custom designed for specific requirements. They are available in different models with different drying capacities.

Bry-Air dehumidifiers find applications in various industries where low temperature drying is required like drying of cocoa, gelatine, yeast, coffee powder, flour, starches, katha, onions, in processing powdery foods like soft drink concentrates, milk powder, sugar, in packaging and storage of biscuits, wafers, snacks and in breweries and distilleries where mold and mildew formation is prevented in hop storages, yeast rooms, fermentation and kegging areas.

The most advanced technology of desiccant dehumidification has been brought to India by Bry-Air India Pvt. Ltd. a joint venture with Bry-Air Inc. U.S.A. Other products from Bry-Air are Plastic Dryers, Heat Recovery System, Mold dehumidification systems, Seed Dryers, Wood dryers, etc.

For more details contact: Arctic India Sales, 20, Rajpur Road, Delhi 110 054.



Low Temperature Drying Systems

### ARTIFICIAL LIMBS WITH CARBON FIBRE BONES

An epoxy resin from Shell Chemicals UK is the basis of a new type of artificial limb. Marketed by J. Hanger & Co. Ltd. of Roehampton it has been tested and approved by the Department of Health and is now being issued internationally.

Lightness and strength are the qualities desired for the tubes which lie beneath the plastics "skin" of artificial limbs. Steel tubes, used previously, were much heavier and not stronger than the new material; aluminium tubes had to be much thicker and therefore lost any advantage in weight.

The new carbon-fibre composite, says Mr. McQuirk, the prosthetics manager of J.E. Hanger, is the 'ideal material', and has the added bonus that the pultrusion process used to make the 'bones' (or tubes) is very accurate. The pultruded lengths are made by Pultrex, whose business was acquired last year by Fibreforce Composites -- a Shell UK subsidiary.

The challenging markets for the limbs are the USA and Japan (Japanese Government approval has already been given), but the limbs are also being marketed throughout Europe, particularly in Scandinavia.

### NEW WATER SOLUBLE POLYMER

A new water soluble polymer on the basis of heteropolysaccharide K1A 112 by Georg M. Langer & Co. is suitable for use in latex dyes. The product is characterised by good suspension properties and resistance to running and makes it possible for the required rheological properties to be maintained in line with specifications. (*Chemische Industrie*, No.1, 1988, p. 26).



For Alok Gum Brand of Genuine Imported

# Gum Arabic Gum Accacia

Contact:

## ALOK CHEM CORPORATION

406, Goradia House, P.O. Box No. 13048

100/104, Kazi Sayed Street, Bombay-400 003

Phones: Office: 320518/326390, Resl: 5610002/5124231, Gram: "GUMSAGAR"

Distributors for North India: M/s. J. CHEM ENTERPRISES

3, New Rajdhani Enclave, Vikas Marg, New Delhi - 110 092

Phones: Office: 2241262, Resl: 2240072, Gram: "CARMECEL"

For Your Requirements Of:

SACCHARINE INSOLUBLE I.P.

TARTARIC ACID

SODIUM POTASSIUM TARTRATE I.P.

SODIUM CITRATE I.P.

SACHHARINE SODIUM I.P.

CREAM OF TARTAR I.P.

ANTIMONY POTASSIUM TARTRATE I.P.

DISODIUM HYDROGEN CITRATE I.P.

Other Fine Chemicals of L.R. & A.R. Grades in bulk  
as per Highest International Standards

Please Contact:

## KRYSTAL PHARMA PRIVATE LTD.

Office: 'Deepa', Block No. 3, 353/B-2, Vallabhaug Lane, Ghatkopar, Bombay 400 077.

Phone: 5112423/5120040

Factory: Road No. 30-31, G.I.D.C. Industrial Area, Phase II, Sarigam, Dist. Bulsar, Gujarat.

Tel: Resl: 4121250/4125075

Off: 273596/463975

Fact: 27 Collem, Goa

For Quality Aroma Chemicals like Geraniol, Citronellol, Citronellal, Ex Citronella Oil, Geraniol Ex Palmrosa, Linalool, Methyl Benzoate, Isoamyl alcohol Esters and other aromatic chemicals

Contact Manufacturer:

## Sugandha Enterprises

Office:

369-B, Vagdevi,

Senapati Bapat Marg,

Mahim, Bombay - 400 016

Telex: 76521 SVPC IN

Farm & Factory:

Pikle Wadi,

Collem

Goa - 403 410

Telex: 194-261 SVPC IN



# Chemicolour

For your imports of:

GUM ROSIN  
GLYCERINE  
ORANGE OIL  
TARTARIC ACID BP/USP  
MONO SODIUM GLUTAMATE  
DI PHENYL OXIDE

PARAFORMALDEHYDE  
LACTOSE BP/USP  
METHYL ETHYL KETONE  
SODIUM FORMATE  
BASIC CHROME SULPHATE  
SODIUM BICHROMATE  
EPHEDRINE HCl/PSEUDO

THEOPHYLLINE ANHYDROUS  
PHENOL BP/USP  
SOYALECITHIN  
MICROCRYSTALLINE WAX  
HYDROGEN PEROXIDE 50%  
SULPHADIAZINE B.P.  
SULPHADOXINE B.P.

Please contact for most competitive rates

## CHEMICOLOUR INDUSTRIES LIMITED

302, T.V. Industrial Estate, Sudam Kalu Ahire Marg, Worli, Bombay - 400 025  
Phone Nos. 4933361/62/63/64 Cable: KEMIKOLOR

Telex: 11-71223 CIL IN

For Your Requirement Of:

**Dimethylamine Hydrochloride**  
**Piperidinol \* Ethylene Chlorohydrin**  
**Choline Chloride Solution (Feed Grade)**

Contact Manufacturers:

## M/s. SRINIVAS CHEMICAL INDUSTRIES LIMITED

**HEAD OFFICE:**  
13, Madhuvan,  
B.S.D. Marg, Deonar,  
Bombay 400 088  
Tel: 5512545/5518221

**FACTORY:**  
E-5, M.I.D.C. Plot,  
Tarapur Industrial Area,  
Boisar 401 506, Dist. Thane.  
Tel. 505

Available at Competitive prices

## BORAX

## BORIC ACID

(Grannular, Powder, Crystals)

Na <sub>2</sub> B <sub>4</sub> O <sub>7</sub> ·10H <sub>2</sub> O-	99.5% min
Chlorides -	0.04% max
Sulphates -	0.05% max
Insolubles -	0.01% max
pH-	9-9.5

Packing : 50 Kg. HDPE bags

(Grannular, Powder)

H <sub>3</sub> BO <sub>3</sub> -	99.5% min
Chlorides -	100 PPM max
Sulphates -	200 PPM max
Heavy Metals -	2 PPM max
Arsenic -	2 PPM max.
pH -	4.2 - 4.7

Packing : 25 Kgs. HDPE bags

## INDIAN BORAX

2, Anand Nagar Society, Jetalpur Road, BARODA 390 005.  
Phone : 323985 Telex : 0175-423 Gram: INDIA BORAX



# ALTERNATIVES TO CONVENTIONAL CURING AND HANDLING OF RAW HIDES AND SKINS\*

CATHERINE A. MONEY  
CSIRO, Division of Protein Chemistry, Australia

## INTRODUCTION

In many countries, conventional stack curing is being replaced by either green processing of unsalted hides and skins or by alternative salting methods. A great benefit for the countries which produce hides and skins is that they can reduce preservation costs and the salinity problem in effluent. In the U.S.A., Australia, New Zealand and some other countries, increasing numbers of hides and skins are being converted to some form of part-processed stock at or near their source. For raw material which must be preserved for a longer period before processing, salt is still the best preservative. The more efficient modern curing methods require different handling techniques to those used for stack salting.

Green processing and efficient salting methods are only worthwhile if leather quality is maintained or improved. Short-term preservation is often necessary to prevent deterioration of hides and skins before they are salted, dried, part-processed or tanned.

## Green Fleshing

Green fleshing has had a major effect on handling of hides and has resulted in through-processing to wet-blue in one drum and better quality tallow and meat meal produced from fleshings. When hides are fleshed before salting, a better, more even cure is achieved.

Hides are delivered to the fleshing machine from the floor directly by conveyor or, more commonly, in bins. Modern handling techniques and machines enable hides to be put on to hooks at floor level, then to be automatically weighed, sorted into weight ranges, conveyed to a raised, through-feed flesher and directed into different bins as they fall down a chute after fleshing. The hides are cooled during the process. The fleshings can be dewatered over a vibrating wedge-wire screen, collected in bins and rendered without delay. The total operation requires only five workers to flesh 300 hides per hour.

Paper presented at the 23rd Tanners Get-Together on the theme "Modernisation of Leather Industry" held in January 1988 at Central Leather Research Institute, Madras.

## Green Processing

Although green processing is mainly associated with wet-blue production, it is also being used in Australia and New Zealand for sheep and lambskins. These skins are either tanned as woolskins or fellmongered to produce both wool and pelts, which are marketed as pickled-pelts.

All types of skins can be processed without salting but problems to be overcome are:

1. Uncertainty of delivery times : Additional shifts or short-term preservation are sometimes needed.
2. Seasonality : During peak supply periods stock can be held in a part-processed form until there is a reduced supply of raw material. In New Zealand fellmongeries close in the off-season.
3. Complications when it is necessary to process the total output of a meatworks, irrespective of weights and grades: It is an advantage if meatworks will sort stock for different customers but otherwise a processing plant can sort at fleshing and process in different weight ranges.
4. Distance between the source of raw material and the processing plant: In some cases new plants have been built, in others, short-term preservation is used during transport.

These disadvantages are often outweighed by the advantages of eliminating the cost of salting, reducing the salinity of effluent, reducing soak times, obtaining green fleshings and improving leather quality.

## Short-term Preservation

Short-term preservation was investigated in India nearly 30 years ago (1) and when it was first studied in Australia a zinc chloride treatment developed by George and Krishnamurthy (2) was tested (3) and since then zinc chloride has become one of the recommended treatments (4) used by the Australian industry.

*Chemical methods* and chilling are now used in Australia mainly to facilitate green processing at wet-



blue plants. The methods in use are all cheaper than salting. Hides are preserved during transportation, over weekends and holidays, in emergencies and when time is needed to build up production packs. Often, preservation is only required for overnight protection and chemical methods are rarely used for more than three day's storage.

The chemical methods are based on the use of either sodium chlorite, calcium hypochlorite, zinc chloride or benzalkonium chloride and are used to preserve hides for up to 6 days at 25°C (Table 1). Addition of fungicides is necessary for storage times greater than three days but chlorinated phenols are not recommended if fleshings or other by-products are to be utilized. Chemical treatments can produce hair loosening due to the action of autolytic enzymes present in the skin (5) and are therefore not always suitable for preservation prior to salting or for tanning of woolskins. Sodium chlorite and benzalkonium chloride can be used for the storage of woolskins for up to 3 days whilst zinc chloride and formaldehyde, which both inhibit enzyme action, can be used for up to 6 day's preservation. Formaldehyde has a tanning action which tightens the wool so it is not suitable if hair or wool are to be removed. Calcium hypochlorite discolours wool.

TABLE-1  
RECOMMENDED DRUM AND SOAK TREATMENTS--  
HIDES, CALF, GOAT AND KANGAROO SKINS

Maximum number of days' storage at 25°C	% Preservative (kg/100 kg. hide)			
	Imprapell	Zinc chloride	Calcium hypochlorite	Benzalkonium chloride (50% BAC)
1	0.2	0.1	0.1	0.1
3	0.5	0.3	0.3	0.3
6	1.0	0.5	0.6	--
<b>Fungicide</b>				
BAC (50%)	--	0.1	0.1	--
Panacide (dichlorophen)	0.05	--	or 0.05	--
Sodium tri-chlorophenate	or 0.1	or 0.1	or 0.1	
% Float (water)	Drum		Soak	
	20-50	100	400	
Time	2 hours	≥ 16 hours	Store in liquor	
Agitation	≤ 10 r.p.m.	Preferable	Preferable	

Drum soak and spray methods have been used but drumming is preferred by industry. Soaking can be carried out in the bins used for transporting hides.

Occasionally short-term preservation has not been adequate and there has been some damage to the resultant leather. Usually either there has been a delay before treatment, the temperature has been too high or insufficient chemical has been added. Small scale trials should be carried out at individual works before production runs are undertaken. The recommended treatment for short-term preservation can be used for soaking dried or salted hides and skins to control bacterial growth.

There is now an enormous literature covering chemical short-term preservation and many treatments have been recommended. Some of these have been compared in the CSIRO laboratory with the methods already in use in Australia. No alternative method has yet been tested which is more acceptable when degree of preservation, cost, environment and leather quality are considered. New preservatives are being developed including possible alternatives to chlorine as broad spectrum disinfectants (6) and some of these may be suitable for hides and skins (7). Any new, acceptable chemicals should be tested for preservation potential.

Chilling has been used for many years in Australia mainly to hold hides before transport to centralised brining plants but increasingly before green processing. The temperature to which hides and skins should be chilled depends on the required time of preservation. When chilling occurs immediately after removal, hides and skins can be kept for 3 weeks at 0°C, 2 weeks at 5°C, 1 week at 10°C, 2 days at 15°C, 1 day at 20°C and less than one day at 25°C. If there is a delay before chilling or a slow rate of chilling, the storage time at a particular temperature is reduced. Various chilling methods can be used provided all areas of all hides and skins reach the required temperature. These includes:

- spray or bath washing with chilled water
- crushed ice e.g. added to collection bins
- dry ice particles (carbon dioxide snow)
- rapid chilling in a freezer
- hooks on a conveyor in a chiller. The chiller can be mobile.

The flesh side of skins can partially dry out during chilling and if these skins are subsequently salted, salt penetration problems can occur. Moistening the skins before salting will allow rapid penetration of salt.

A chilling plant has recently started operating in Melbourne, preparing hides for trucking 750 kilometers to a wet-blue plant. Hides are hung on hooks on a continuous chain which firstly takes them through a high



ssure washer, then through a chiller which chills them 5°C in 48 minutes while they drain. Finally they are conveyed out from the hooks. As the hides fall into a te, two men fold them with the hair-side out. When hides are packed into a crate it is taken to the chiller. ur workers, with a rotating forklift, can process 300 les per hour. Before transportation, hides from two tes are combined to give 70 hides in an extended ate. Each crate is covered with plastic and a truck- d is covered with a tarpaulin. The hides are being nsported to 750 kilometres in 12 hours and the tem- perature of the outside hides rises only 2-5°C, even in arm weather. Hides are being kept upto 10 days prior transport and a further 24 hours at the tannery before shing and green processing. In future, the hides may e fleshed before packing to reduce weight, and hence nsport costs, and to reduce the amount of handling ecessary. Fleshed hides could be emptied directly into e tanning drums from the bins. The chilled hides flesh xtremely well.

The total cost per hide is less than 40% of salting costs and the hides do not need a soak. The operation is justified by the cost savings and improved wet-blue quality without effluent consideration. Effluent salinity is not a problem at either the point of chilling or processing due to coastal location. For inland areas where salinity is a problem, such a chilling system would have additional benefits.

### Comparison between Chilling and Chemical Methods

The main advantages of chemical methods are:

- 1. The continuing protection given during transportation and delays.
- 2. The ease of application, especially in tanning drums or converted concrete mixers.
- 3. Treatments using either sodium chlorite or calcium hypochlorite alone do not affect byproducts or effluent.

The disadvantages of chemical methods are:

- 1. They are not recommended when temperatures are continuously above 30°C.
- 2. All the chemicals need to be handled with care although some are more hazardous than others.
- 3. Some of the chemicals cannot be used in particular circumstances due to effluent restrictions or contamination of byproducts.
- 4. Loosening of hair or wool can occur within 2 days at 25°C, as already mentioned.

The main advantages of chilling are:

- 1. Meatworks have expertise in refrigeration and sometimes there are facilities for chilling available.
- 2. No pollution.
- 3. No contamination of byproducts.
- 4. Suitable for all hides and skins.
- 5. No hair-loosening. Chilling is therefore suitable for wool skins and hides which will subsequently be cured or tanned with the wool or hair on.

The main disadvantages of chilling are:

- 1. Hides and skins are good insulators and retain the body heat so they should be chilled individually, immediately after removal.
- 2. Damage can occur if low temperature are not maintained during transport.

### A COMPARISON OF CURING METHODS

Brining in raceways, or drums, and drum salting with no added water are labour-saving alternatives to conventional stack salting which are now widely used in Australia. Brining is the most common method used for hides but is not suitable for calf or sheep skins because they are more susceptible to damage than hides and continual re-use of brine allows build up of contaminants and bacteria, even when additives are used. Drum salting is the major method for sheep, calf, goat and kangaroo skins. Until recently customers preferred brined to drum salted cattle and buffalo hides but dry drumming is a simpler process and some companies are now successfully marketing drum salted hides overseas. If care is taken, all curing methods give good results.

In both brining and drum salting the temperature should be kept below 30°C (preferably below 25°C), to prevent "brine draw" and dispersion of fat. Tanners must ensure that their soaking process results in complete rehydration of brine and drum cured hides and an alkaline soak (e.g. 1% sodium carbonate) may sometimes be necessary to overcome brine draw.

During any method of salting, sodium chloride penetrates the hide, some protein is removed and water is released as brine. The water remaining in the hide should be almost saturated with salt. Sufficient salt must be available to all areas of the flesh side of the hide for sufficient time to achieve the required salt uptake. For 'stack' salting, the weight of salt should be approximately one third of the hide weight, but less salt, approximately 20% of hide weight, is required for drum and brine curing as there is less wastage. It is not necessary to wash



hides or skins before salting but if hides are prewashed, more salt is necessary to achieve the required saturation levels.

### Weight of Salted Hides

The weight of a cured hide depends on the salt and moisture content and the amount of flesh, dung and salt adhering to the hide. A cured hide, free of excess salt, weighs less than a green hide. By controlling the brine concentration or the amount of salt offered, hides of similar weight can be produced by both brining and drum salting. However it should be remembered that the higher the ratio of salt to moisture in a hide, the lower the risk of deterioration. The sale of hides by weight unfortunately encourages sale of hides with too much water and the result is unsatisfactory preservation.

### Degree of Cure

It is generally accepted that a cured hide should contain less than 50% moisture and this moisture should be at least 85% saturated with salt, giving an ash-to-moisture ratio in the hide of about 30:100 (30%). In the presence of effective salt additives, an ash-to-moisture ratio of 27-29% does not necessarily indicate inadequate preservation, particularly if analysed immediately after curing, but the aim in curing should be for high salt levels.

### Effluent

All salting methods produce a brine effluent and a 25 Kg hide produces about 5 litres of brine. It has often been thought that brine curing does not result in brine effluent, but when brine is regenerated and reused in either a raceway or a drum, considerable volumes of excess brine are formed.

### Salt Additives

The use of additional preservatives is strongly recommended for all salting methods. Additives improve the preservation of hides and are essential to prevent wool slip in sheep skins. The bacteria that cause the red discolouration known as "red heat" may not themselves cause hide damage, but hides cured without added preservatives can be contaminated with other bacteria which do cause damage, e.g. hair slip in hides and grain damage in resultant leather. If salted hides are to be kept for only a few weeks at less than 25°C before being processed, preservatives are not so important.

If additives are used, it is not necessary to use expen-

sive stoved (heat sterilised) salts. Initial curing without preservatives, and subsequent re-curing with preservatives, is not recommended.

For drum or stack salting, 1% sodium fluoride, or 1% naphthalene plus 1% boric acid, calculated as percentages of the weight of salt used, are preservatives which have been used successfully for hides, calf, goat and kangaroo skins. Several other combinations of additives are recommended for sheep skins (see Drum Salting). Sodium fluoride is better than naphthalene plus boric acid for preservation at high temperatures, e.g. 35°C. Naphthalene is volatile and salts containing naphthalene should not be stored for long periods, especially in warm conditions. Sodium fluoride (NaF) is a poison. Dust inhalation and skin or eye contact may cause irritation and should be avoided by the use of proper protective equipment.

For brine curing the addition of sodium fluoride is recommended, and a minimum amount equal to 0.3% of hide weight is required. Higher levels of NaF give even better preservation and control of red heat.

With salts of high calcium or magnesium content (over 0.05%, i.e. 500 p.p.m.), sodium fluoride precipitates insoluble, inactive calcium and magnesium fluorides and additional fluoride is necessary to control bacterial growth.

### Automated Salting

Salting can be automated, e.g. calfskins can be salted on conveyor belts using an automated system then immediately folded and packed for shipment.

### Brine Curing

Australian hides are being brined in raceways, hide processors, mixers and drums. The brines are reused indefinitely and are continuously screened through wedge wire screens, to remove solids, then regenerated by passing through a lixator (a tall container of salt). The brine should always be above 90% Salinometer (90% saturated); the higher the better. Wedge wire screens remove hair and larger solids but not dirt and sediment, which could be removed by installing a settling tank for sedimentator before the lixator.

In some cases brines are heat treated to reduce bacteria, protein and accumulated solids but although used brines look dirty, it is not necessary to heat treat them if additives, e.g. sodium fluoride are used to control bacterial growth on the hides.



Hides and skins should be agitated in the brine for 24 hours in order to achieve a satisfactory level of salt. Agitation times of 16 hours are common but the time will depend on the system used, the degree of saturation of the brine and the thickness of the hides. The appropriate time for a particular plant can be determined by testing the ash to moisture content of the thickest hides processed after a range of agitation times. In all cases, a brine float of approximately 500% (i.e. hide:brine of 1:5 by weight) is used and a tank with a capacity of 55,000 litres can hold approximately 500 hides. The tanks are fitted with paddles to keep the hides circulating. When mixers or drums are used for brining, a brine float of approximately 100% is used and it is therefore essential to continuously recirculate the brines through a pump or to add solid salt to provide the hides with sufficient salt.

After curing, hides are usually drained on a conveyor before packing. Sodium fluoride has been successfully used as a brine additive in Australia for over 10 years. The recommended level of 0.3% NaF on hide weight is adequate for present Australian requirements but more is needed initially, to give a base level in the brine, and in subsequent uses if there is calcium and magnesium in the salt. Some works have had problems with insoluble fluorides in the system when they use salts with high calcium and magnesium contents.

Although in the past chlorinated phenols have been recommended as hide preservatives, due to their toxicity they should not be used, especially when by-products are utilised for human or animal consumption, e.g. sausages, sausage casings, dog chews.

## Drum Salting

In Australia, buffalo and cattle hides and all types of skins are drummed with salt in wooden drums, steel or glass hide processors or mixers, or stainless steel butter churns for approximately one hour (skins) or 4-7 hours (hides). The time will depend on the hide thickness and the drumming action, which is less efficient at high loading rates. Optimum conditions should be determined for a particular system.

Usually the drum speed is less than 5 r.p.m. but higher speeds have been used for sheep, goat and calf skins without damage. Higher speeds can lead to heat build up and poor grain quality and are not recommended for hides which require longer drumming times. Concrete mixers have been modified in various ways including changing the drive, reducing the blade depth, putting a rounded edge on the blade and sandblasting rough edges

which could damage the skins. Drum salting causes abrasion of drum linings.

The number of skins or hides in a load depends on various factors. A butter churn can hold up to 300 lambskins and an 8 cubic metre mixer can cure 4 tonnes of hide in 4 hours at 4 r.p.m. Hides and skins are loaded either manually, by conveyor systems or using fork lifts to empty bins into drums. Unloading varies for different types of drums. A tray on a fork lift is used to unload butter churns while they are rotating, drums can be emptied through a door into bins and the reverse action of mixers is used to feed out skins.

Salt is usually of medium grain size for hides but sometimes stoved, fine salt is used for sheepskins. Approximately 25% salt, based on green weight, is commonly used although more is necessary if skins are washed before salting. The recommended additives can be premixed with the salt or rotated with the salt before the hides or skins are added.

Salt additives are even more important for skins than they are for hides and they are essential for lamb and sheep skins. The additives used for lamb and sheep skin are 1% zinc chloride plus 1% sodium fluoride, 1% zinc oxide plus 1% boric acid plus 1% sodium metabisulphite, 1% naphthalene plus 1% boric acid (this causes pink discolouration in New Zealand where skins are washed before salting), or 1% sodium fluoride plus 1% boric acid.

After salting, hides and skins are usually allowed to drain for a few days before packing. If hides are laid flat, rather than bundled in a bin, they are easier to fold after draining.

## Storage and Transport of Salted Stock

If there is insufficient salt in hides and skins or no additives present, hair slip and a bad odour may develop during storage. The storage life of well salted hides and skins depends on storage temperature, humidity and the salt additives used.

Hide stores should be well ventilated and designed to keep skins as cool as possible. Very high temperatures of 55°C or 60°C damage well salted stock because the hide structure changes from collagen to gelatin. There is no smell or hair slip but the damage becomes obvious during processing. Dry-salted hides and skins are dried after curing and will withstand high temperature storage. They are often preferred to dried skins.



## Drying

Large numbers of Australian sheep skins are air dried but drum salting is becoming the preferred method of preservation because it is quick and uses less labour. Drying overcomes salt effluent problems and uses solar and wind energy. If skins were fleshed prior to drying, the problems associated with drying would be reduced.

## OTHER PRESERVATION METHODS

Gamma and electron beam irradiation (8) of hides may be suitable in some circumstances but will require large capital investment.

Freezing is expensive and it is difficult to thaw frozen stock without any deterioration occurring.

## CONCLUSION

Although there still appears to be a need for an alternative to salt for preservation, the best alternative at present is to make changes to facilitate green proces-

sing. After all, salting is often not necessary, only a convenience which often causes problems.

## REFERENCES

1. Nandy, S.C. and Sen, S.N., *Bull. Central Leather Res. Inst., Madras, India*, **6**, 315 (1960).
2. George, L.C. and Krishnamurthy, V.S., *J. Indian Leather Technologists Assoc.*, **14**, 4 (1966).
3. Money, C.A., *J. Am. Leather Chem. Assoc.*, **65**, 1 (1970).
4. Money, C.A. *J. Am. Leather Chem. Assoc.*, **69**, 1 (1974).
5. Money, C.A. and Scroggie, J.G., *J. Soc. Leather Technologists Chem.* **55**, 333 (1971).
6. Williams, D.E., Worley, S.D., Barnela, S.B. and Swango, L.J., *Appl. Environ. Microbiol.*, **53**, 208 (1987).
7. Uma, L. and Krishnamurthy, V.S., *Leather Science*, **3**, 165 (1985).
8. Bailey, D.G., Wang, S.S. and Herer, A.S., *J. Am. Leather Chem. Assoc.*, **82**, 138 (1987).

### FOR URGENT ATTENTION OF RESEARCH SCIENTISTS

A very special attractive offer of the following internationally reputed redback journals on Chemistry

1. ANALYTICA CHIMICA ACTA 1981-1984 (Vols 1-122) Free with the above 1947-1980 (Vols 1-122) Or 1985 (Vols 167-178)	Rs 80,190 00 Rs 20,000 00 Rs 21,870 00
2. ANGEWANDTE CHEMIE (International Edition) 1981-1984 (Vols 15-19) Free with the above 1976-1980 (Vols 15-19) Or 1985 (Vols 24)	Rs 15,400 00 Rs 3,500 00 Rs 3,850 00
3. ARZNEIMITTEL-FORSCHUNG/DRUG RESEARCH 1981-1984 (Vols 31-34) Free with the above 1976-1980 (Vols 26-30) Or 1985 (Vols 35)	Rs 2,000 00 Rs 2,200 00 Rs 2,330 00
4. BIOCHIMICA ET BIOPHYSICA ACTA 1981-1984 (Vols 634-805) Free with the above 1947-1980 (Vols 1-633) Or 1985 (Vols 806-847)	Rs 3,21,210 00 Rs 77,000 00 79,435 00
5. CARBOHYDRATE RESEARCH 1981-1984 (Vols 87-132) Free with the above 1973-1980 (Vols 26-86) Or 1985 (Vols 133-145)	Rs 83,835 00 Rs 23,000 00 Rs 23,692 50
6. CHEMICAL ABSTRACTS WITH ANNUAL VOLUME INDEXES 1981-1984 (Vols 94-101) Free with the above 1907-1980 (Vols 1-93) Or 1985 (Vols 102-103)	Rs 3,68,200 00 Rs 1,00,000 00 1,16,480 00
7. JOURNAL OF AMERICAN CHEMICAL SOCIETY 1981-1984 (Vols 103-106) Free with the above 1978-1980 (Vols 100-102) 1985 (Vol 107)	Rs 25,758 00 Rs 6,350 00 Rs 6,439 00

### JOURNAL OF THE CHEMICAL SOCIETY

(London) All Sections Consists of the following Sections  
Chemical Communications 1981-1984 Rs 18,114 20  
Dalton Transactions Rs 22,539 80  
Perkin Transactions I Rs 20,080 00  
Perkin Transactions II Rs 16,114 20  
Faraday Transaction I Rs 13,503 60  
Faraday Transaction II Rs 11,797 00

Free with the above  
all sections from 1902-1980  
Or  
All Sections for 1985 £ 1222 30,572 00

9. JOURNAL OF CHROMATOGRAPHY 1981-1984 (Vols 203-311) Free with the above 1958-1980 (Vols 1-202) Or 1985 (Vols 312-345)	Rs 1,88,025 00 Rs 57,000 00 Rs 58,650 00
10. JOURNAL OF ORGANIC CHEMISTRY 1981-1984 (Vols 46-49) Free with the above 1978-1980 (Vols 43-45) Or 1985 (Vols 50)	Rs 19,944 00 Rs 4,900 00 Rs 4,988 00
11. JOURNAL OF ORGANOMETALLIC CHEMISTRY 1981-1984 (Vols 204-278) Free with the above 1969-1980 (Vols 15-203) Or 1985 (Vols 279-297)	Rs 1,87,200 00 Rs 48,500 00 Rs 47,424 00
12. JOURNAL OF MEDICINAL CHEMISTRY 1981-1984 (Vols 24-27) Free with the above 1978-1980 (Vols 21-23) Or 1985 (Vols 28)	Rs 13,426 00 Rs 3,250 00 Rs 3,356 00
13. TOXICOLOGY & APPLIED PHARMACOLOGY 1981-1984 (Vols 57-76) Free with the above 1978-1980 (Vols 34-56) Or 1985 (Vols 77-81)	Rs 38,440 00 Rs 7,000 00 Rs 7,288 00

Besides the free volumes along with the sets for 1981-1984, we will allow you 25% discount on the price of sets for 1981-1984.  
Sets nicely bound with golden printing on spine will be supplied free to your nearest railway station.

Other internationally reputed journals on all subjects are also available at our specially reduced prices. We also supply current Indian journals.

### INTERNATIONAL PERIODICALS SUPPLIERS

(Largest stockists & Suppliers of Research Journals over 2 decades)

172-C, Pushpanjali Enclave

Premapura

Delhi - 110 034 Phone : 7127319 Tlx : 31-4822 TOYO IN



# LEATHER ABSTRACTS

INCREASING OPERATING EFFICIENCY, J.H. Haber-  
elal, *American Shoe Making*, 362 (4) 50, 1988.

This article examines the chances of fulfilling demands for greater 'Operating efficiency'. The question whether this demand is at all appropriate in view of the current performance level of the Central European Shoe Industry is purposely left open. The primary aim is to search for procedures for increasing plant performance.

MAN MADE ALTERNATIVES TO LEATHER, R. Turner,  
*Shoe & Leather News*., CCCLXXI, 3760, 14, 1988.

It is generally agreed that by the year 2000 there will be insufficient leather available to satisfy world footwear production requirements. This is due mainly to the steadily rising world population coupled with more countries seeking to develop their economies. This means that synthetic or man-made upper materials are likely to be more important and this paper looks at current developments in synthetic materials.

THE STUDY OF PHYSICAL TESTING OF LEATHERS,  
J. Lange, *Das Leder*, 39, 81, 1988.

This paper describes to which level the physical leather test methods have developed. In this first series of reports the problems of climatisation and of taking samples, the agency methods for leather and finishing, the determination of stability of leather furnishing, the determination of reaction to water when put under dynamical stress in the penetrometer and finally a test of continuing tearing are discussed.

PEPSIN SOLUBLE COLLAGEN FROM KANGAROO  
SKIN, L.J. Stephons, J.A. Werkmeister, J.M. Caire and  
J.A.M. Ramshaw, *Das Leder*, 3a, (5) 88, 1988.

Collagen from Kangaroo skin was solubilised using pepsin digestion and purified by NaCl precipitation. The preparation gave type I and type V Collagens which were compared with the equivalent bovine Collagen by amino acid analysis, by examination of cyanogen bromide fragment sizes and by melting temperature determinations. This suggested that bovine and Kangaroo Collagens were significantly different, whereas the type V Collagens were very similar.

There was no evidence for any trypsin soluble type III collagen with Kangaroo preparation.

THE PROPERTIES OF WET BLUE, W-Luck, H. Rosentreter and B. Wehling, *Das Leder*, 39 (4), 61, 1988.

The content of inorganic cations and anions as well as the COD value of aqueous extracts of commercial wet-blues from various sources was determined. This work was carried out in view of the effluent problems facing tanneries processing wet blues. Large differences were found between wet blues of different origin. Hence the influence of the deliming and pickling process and of various types of chrome tannages was examined by way of matched sides trials. Furthermore, changes in the wet blues during an extended storage period (i.e. 1 year) were studied. For this purpose, the content of bleachable chrome, the acidity and the proneness to mould formation on the leathers are checked. The influence of different tanning processes in this respect was examined and it was observed that in the mould affected areas distinct increase of the pH-value are found. This phenomenon can occur even before any mould becomes visible on the surface of the leather. Uneven dyeings can be the result. By way of matched sides trials, it is shown that this increase of the pH is always liable to happen when formates are used in the tanning process.

IS RESIDUAL LIQUOR WITH ONE MILLIGRAM OF  
CHROMEOXIDE ATTAINABLE? Kh. Fuchs. *Das Leder*,  
3, (2), 31, 1988.

Chrome pollution of waste water from the tannery is increasingly becoming the number one ecological problem factor for the tanner. In this paper, a new, high exhaustion process is introduced which, at a chromic oxide concentration of 1% calculated on pelt weight, supplies leather of excellent quality.

CHROME RETANNING OF WET BLUE LEATHER  
WITH HIGH DRAINING, B. Wehpingi H. Rosentreter,  
*Kozaibuca*, 37, 49, 1988.

This paper describes the advantages of retanning with synthetic chrome agents. This enables high draining of chrome in retanning process so that little chrome enters



to waste waters. At the same time the leathers are subjected to retanning and to neutralisation.

**NEW WAYS TO MAKE LEATHER WATER RESISTANT**, B. Higham, *World Leather*, 1 (1), 27, 1988.

Water repellancy is a property desirable in many leathers nowadays and one need not make leather before making it water resistant. Treatments can be applied in the drum and resultant leather can often be dry cleaned without impairing its properties. In this paper, the author looks at recent developments in Germany.

**MICROBIAL INSPECTION OF LEATHER AND ITS CONTROL**, H. Gattner, W. Linder and H.U. Neuber. *Das Leder*, 39 (4) 66, 1988.

Some new aspects of preservation of Leather with modern fungicides in tanneries are presented. The advantages of combination of active fungicides for the protection of wet blues are stressed especially. Practical hints for severe inhibition of moulds on wet-blue are given, taking into consideration the special partition

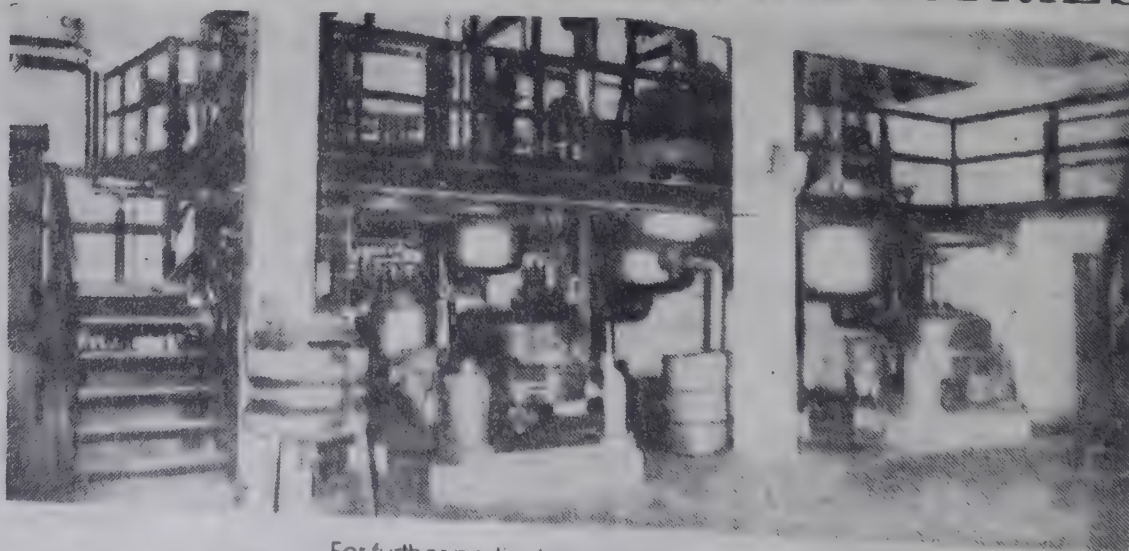
properties of octylisothiazolinone, methoxycarbonylamino-benzimidazole and thiocyanato methoxythio-benzothiazole. The analysis of the heterocycles of wet blue is performed by HPLC.

**THE PRODUCTION OF SOLUBLE PROTEINS FROM WOOL WASTES**, H.H. Mies and H. Zahu. *Das Leder*, 39, (4), 73, 1988.

Black wool parts are produced with the aid of a sulphuric treatment during the carbonising of wool with parts of plants as well as during the following teasel process. These parts cannot be used for textile purposes. As this material consists of 70-75% wool fibre waste and wool of fibre proteins, it was investigated how to gain soluble wool proteins by reductive extraction in such a way that would allow cosmetic application. The reduction and conversion with iodine acetate produced carbo-methylated wool proteins with an average weight of 50,000 with a produce of 45%. If one adds cystine to the protein extract, the produce raises to 65%. The cystine remnants of the wool proteins formed mixed disulphides with the cystine. This cystine enriched product could be used as a starting material for cosmetics.



**Reputed Manufacturers of  
PLANT & MACHINERY for PHARMACEUTICAL  
CHEMICAL, and OTHER INDUSTRIES.**



For further particulars please contact :

**MAG ENGINEERING WORKS (INDIA)**

2/A, VAIBHAV INDUSTRIAL ESTATE, NEAR L & T, POWAI,  
SAKI VIHAR ROAD, BOMBAY - 400 072. PHONES: 6326149, 6328138, 6320674



# NEW PRODUCTS & PROCESSES

## NEW PRODUCTS FROM BASF

**Lipoderm liquor L2** is a new type of fat liquoring agent for leather presented by BASF. It has good penetrating properties and produces a soft velvet like surface feel. It is therefore particularly suitable for fat liquoring all types of soft leather, such as clothing and other leathers, including suedes. The product is used preferably in combination with sulphited natural oils and synthetic fat liquors. Leather fat-liquored with Lipoderm has good light fastness. The product can therefore also be used for fat-liquoring pale leathers.

**Astacin systin ACR** is a novel reactive top coating process. It displays substantially better range of properties than other systems, especially with regard to wet abrasion resistance, resistance to scratching, high temperature stability, flex resistance and light fastness. Corial Matt Lacquer CM, Corial Lustre CE and Corial Diluent B an inert solvent are used together with the three products described below in this new system.

**Astacin Finish RA** is an acrylic polymer dispersion containing reactive groups, manufactured by solution polymerisation. Astacin FX RB is a solution of a polyfunctional organic compound. Astacin soft RC is an extremely low volatile plasticizer consisting of a special organic ester.

**Eutresol Hardener FC** enables finishes with very high water repellency to be produced. Optimum water repellency can be achieved by operating continuous plating machines at temperatures of 170°C and above. There is no danger of plated finishes becoming brittle.

**Corial Microbinder BM** is a new type of highly water resistant binder. The finely divided dispersion forms a tough, scarcely tacky finishing film. When used in combination with Corial Microbinder AM, the new product gives finishes suitable for soft leathers with interesting handle properties.

## PORTABLE METER

The KM 1205 is a battery powered (or mains if required) instrument which can measure and print pH, temperature and millivolts. Accurate printed records can be taken to back up research and reports.

It is a portable, digital measuring printer for pH, and features automatic temperature compensation and electrode standardisation to NBS buffers 4.0, 7.0 and 9.2 whilst allowing temperature of buffer solutions to vary from 0-40°C. The instrument features a date/time clock which automatically prints day, month and year.

*Leather, 190, (4557), 1988.*

## CHINA — NEW SOURCE OF WET SALTED HIDE

A 'new source' of wet salted hides is People's Republic of China which has started trading with Italy. Until last year, buying was canalised through Beijing but now each province is responsible for its own business.

*World Leather, 1, (5), 1988.*

## NEW CHROME USE TANNING FROM ICI

ICI has introduced a new patented product to replace chrome, totally or partially, in tanning leather in what they describe as the biggest breakthrough in tanning for 100 years.

**Synektan TAC**, the new product, is based on the use of aluminium, titanium and magnesium researched and perfected by ICI Colours and Fine Chemicals at its Leather Centre at St. Clair Du Rhone, France. It is claimed to reduce the use of chemicals requested for wet processing by up to 50% and similarly reduces the use of water and produces water effluent which is toxic free and environmentally acceptable. Synektan TAC will be available world-wide from September 1988.

*World Leather, (5), 1988.*

## ACQUEOUS UPHOLSTERY FINISHING

A new aqueous polyurethane finish which meets the demand for upholstery leather has been developed by Earnshaw Ltd. It will withstand 300 wet rubs and 1,000 dry rubs on the Veslic, 1,00,000 flexes as the Bally flexing machine and also exhibits good adhesion properties. The new system utilises a cross linking agent which improves the physical properties after 24 to 48 hours.

*World Leather, 1, (5), 1988.*



# INDIAN LEATHER SCENE

## INDUSTRY PERTURBED OVER MOVE TO BAN EXPORTS OF SEMI-PROCESSED LEATHER

The Government policy to totally ban export of semi-processed leather from April 1, 1990, is causing worry to the industry and trade.

As a first step, the Government has already cut the overall semifinished leather export quota by 50% from April 1, this year. A further cut of the remaining 50% is sought to be effected next year leading to a total ban on export beyond 1990.

Addressing the annual general meeting of the All India Skin and Hide Tanners and Merchants Association at Madras recently, Mr. C.K. Duraivelan, President, said since the current export import policy is valid from 1988 to 1991, the trade never anticipated any ban on export during this period. The move will badly hit small tanners in particular, who thrive on export of EI leathers.

The trade is already reeling under financial constraints with the implementation of the new provision that licences will be issued only on the basis of the highest prices tendered by the exporters against bank guarantee. Despite several representations made by the trade, the Government has refused to change the policy and exports have since come to a complete standstill.

Even otherwise, semi-finished leather exports have been on the decline in the wake of the Government policy and last year, it amounted to only Rs. 72.5 crores. Mr. Duraivelan felt that it will not be in the country's interest to lose some of the traditional markets which have been built over the years.

He noted that even advanced countries are allowing export of all items, including semi-finished leather, as a happy product-mix is necessary to sustain the general export trade. In the circumstances, he appealed to the Government not to totally ban export of semi-processed leather and allow the trade to continue exporting at the current level.

Referring to tannery effluent treatment projects, he said that the common plant at Vaniyambadi is likely to be commissioned shortly. The Tamil Nadu Leather

Development Corporation (TALCO) has also undertaken setting up of similar plants at Ranipet, Ambur and Perambalur where cooperative societies have already been formed for the purpose.

TALCO will carry out the effluent treatment projects at Dindigul, Erode, Trichy and Pallavaram also. Whenever collective disposal is not possible, many tanneries have put up individual plants. Mr. Duraivelan, however, made a plea to the State Pollution Control Board not to be vigorous with tanners but guide them in executing the projects economically. Also, the Centre and State Government should consider granting subsidies and soft loans to set up the plants.

While thanking the Tamil Nadu Government for bringing down the sales tax on dressed hides and skins from 2% to 1%, he also reiterated the trade's other longstanding demands like total exemption of tax on sale of dressed hides and skins which have already attracted tax at raw stage; exemption of the tanning industry from the purview of tax on works contract and treating leather in any stage as one commodity.

## LEATHER INDUSTRY MAY FACE RAW GOODS SHORTAGE

There has been a decline in the stocks of all the major species of livestock in the country in recent years, which is feared to pose serious raw material shortage problem for the fledgling domestic leather industry in the coming years, writes Mony K. Mathew in *Financial Express*.

The livestock front, in fact, had recorded a positive growth rate from 1977 to 1982 in almost all the states which is considered one of the major factors contributing to increased activities in the leather industry in the following years. But the trend has since been reversed according to a survey conducted by the Central Leather Research Institute (CLRI), Madras.

The decline in stocks has been attributed to a variety of factors like drought conditions, growing shortage of fodder and grazing lands, neglect of young stocks, premature slaughter of young animals and large-scale inter-state migration of bovine stock for slaughter.

The fall in grazing lands has been severe in major



y of the States. Information collected from 120 sample villages showed that 68% of them reported shrinkage of grazing lands, 31% a stagnant situation and hardly 1% an increase in the area. Gujarat and Maharashtra are the only two States where 8% of villages registered expansion of grazing facilities on account of additional lands brought under fodder crops.

The significant reasons for the decline of grazing lands are diversion for raising crops (31%), diversion for commercial and housing purposes (27%) and Government acquisition (25%). Of these diversion for commercial and housing purposes is the highest in Kerala (50%), followed by Uttar Pradesh (46%) and Rajasthan 41%.

Acquisition by the Government led to reduction of grazing land to the extent of 40% in Maharashtra, 33% in Rajasthan, Madhya Pradesh and Tamil Nadu and 35% in Jammu and Kashmir and Andhra Pradesh. Lack of veterinary facilities and problems of livestock management are other important reasons for the decline in stocks.

The survey has found that in the absence of any concrete programmes exclusively for meat animal development, the gap between demand and supply for meat animals has been widening. In the process, substantial erosion in the productive and seed stock has taken place in almost all the species of livestock.

It has also been noticed that the best breeds in the country that move to urban centres end up there after lactation. The young calves perish in the urban centres due to neglect and starvation. Under the circumstances, the CLRI study feels that it will be a stupendous task to meet the growing demand of human population in terms of animal products, particularly meat and meat products. The acute shortage of supply is reflected in the steep rise in meat prices all over the country.

The boom conditions that prevailed in the leather industry during the last three or four years was due to increased slaughter and heavy mortality of animals following drought and fodder shortage. But the study warns that the industry's long-term perspectives depend on regulated slaughter of animals on the one hand and stock-building activities on the other.

#### EXCISE EXEMPTION LIMIT MAY BE RAISED TO RS. 1.5 CR.

The excise duty structure for leather footwear industry may soon undergo major changes. The need for accelerated modernisation of the sector to cater to the

ever-growing domestic and international markets, as also the declining raw material resources necessitating conservation of leather are understood to be the major factors that have influenced the thinking of the concerned on these lines.

According to reliable sources, a five-member sub-committee set up by the Development Council for Leather and Leather Goods to study the excise structure has unanimously recommended certain changes keeping in view the basic shifts that have come about in the industry recently in its production pattern and marketing priorities. The panel, headed by Mr. A. Sahasranaman, Executive Director, Council for Leather Exports (CLE), has already submitted its report to the development council.

The committee has suggested, among other things, the raising of excise exemption limit from the present level of Rs. 15 lakhs to Rs. 1.5 crores of annual turnover. This is based on the projected massive capacity creation that is required to achieve the production and export targets set for the turn of the century.

It is pointed out that the industry will have to produce 450 million pairs of footwear by 2000 AD to meet the envisaged demand of 250 million pairs for domestic consumption and 200 million pairs for export. At 80% utilisation, this means having a production capacity of 563 million pairs.

As of now, the cottage sector accounts for as much as 266 million pairs out of a total of 350 million pairs manufactured in the country. Of the balance, 100 million pairs are made in the semi-mechanised small sector and another 24 million pairs in 15 DGTD-registered units. The excise exemption limit has been fixed with the avowed objective of supporting the cottage industry employing people from the backward communities.

However, in the context of the rapid rise in prices of raw material on export demand, without the corresponding increase in footwear prices, the hand-made footwear manufacturers in the cottage sector are now surviving by cutting their own wages. It is estimated that the wage level for a closed pair of shoes in the cottage sector is now only Rs. 20 where it is Rs. 5 in a mechanised unit.

Indication are that the wage level for the artisans in the cottage sector will continue to come down for reasons like the limited availability of raw material and the extreme price sensitiveness of the footwear market. Already, there has been a massive exodus of artisans



to other more remunerative areas like agriculture and road construction.

A spin-off of this situation is the perceptible decline in the quality of the footwear made. This is evidenced by the fact that the country could export only 15 million pairs of footwear which is less than 1% of the world export market. Even in this, good quality footwear amounts to only three million pairs.

Against this background, the committee feels that the excise policy followed by the Government has 'effectively shut the doors towards mechanisation and modernisation'. Since mechanisation is the only solution to the problem, it is observed that the time has come for a review of the objective behind the support given to the cottage sector in the form of excise duty.

The panel holds the view that for a mechanised unit to be viable, it should have a minimum capacity of 500 pairs and the annual turnover of such a unit will be around Rs. 1.5 crores. Besides, expenditure on marketing efforts will be a huge burden on the unit. In the circumstances, the committee sees a positive need to raise the excise exemption limit to Rs. 1.5 crores. Also, footwear up to a value of Rs. 125 per pair should be exempted from the duty as at today's cost it is impossible to make shoes below that level.

An alternative proposal in this regard is that units using less than 10 HP power or employing not more than 49 workers may be exempted from duty. Another recommendation of the panel is that components should not be subject to excise duty. The emerging trend in other countries, notably in Italy, is establishing assembly lines for making complete footwear from components manufactured at various ancillary units. The Union Government has also been encouraging this system which ensures better quality. In the event, the panel argues that the excise duty on components will act as a disincentive for going into assembly manufacture.

In the wake of the rapidly shrinking domestic raw material base, it is pointed out that the excise on rubber and PVC footwear should be completely dispensed with so as to conserve leather. Presently, the rate of duty on these is 20%.

The panel has also suggested doing away with the duty on branded goods if these units come under the purview of the exemption limit. The current policy is to levy duty on branded goods irrespective of the turnover limit. The CLE chairman, Mr. Mohammed Hashim, has also made a strong plea for review of the existing excise

structure at the recently held Development Council meeting in Bangalore.

## NEW EXPANSION POLICY MAY HIT LEATHER INDUSTRY

The new Government policy in regard to capacity expansion in finished leather manufacturing is feared to adversely affect the industry. The policy, while relaxing the locational restrictions on setting up additional capacity, has also made it clear that the Government will keep in mind the need for regional dispersal of new tanning units before granting approvals. Also, the question of restructuring the capacity in areas already over-saturated will be another point of consideration.

Finished leather industry circles feel that the policy will amount to denying opportunities for the units to expand and grow as also result in the closure of a number of units, especially in Tamil Nadu. It is pointed out that the share of licensed tanning capacities in Tamil Nadu for hides and skins are 33.17 and 67.79%, respectively. At the same time, the total availability of these raw materials in the State is 5.32% hides and 8.66% skins, thereby keeping the capacity far above the availability.

At present, to feed the huge capacities existing in the State, raw materials are being procured from other parts of the country. But, in the wake of the recent liberalisation, new tanning and finishing units are bound to come up in those areas which will cut off the flow of raw materials to Tamil Nadu. Under the circumstances, the organised units in the State will have to be eventually closed down affecting sizeable employment opportunities.

Therefore, the Indian Finished Leather Manufacturers and Exporters Association has appealed to the Government to reconsider its decision and amend the present liberalisation.

## WORLD BANK KEEN TO FUND LEATHER PROJECTS

The World Bank has shown interest in funding two projects in India for the setting up of sophisticated modern mechanised leather complexes, according to the Indian Leather Technologists' Association (ILTA).

An ILTA press release, issued in Calcutta said that the World Bank had asked the Central Leather Research Institute (CLRI) for proposals for setting up one unit each in the southern and eastern regions of the country. The release said that Mr. Sanjoy Sen, president of the ILTA



who is also the chairman of the research council of the CLRI along with the director of CLRI, Dr. R.B. Mitra recently met Mr. Jyoti Basu to seek his assistance in identifying a suitable plot in and around Calcutta for setting up the proposed integrated leather complex. The chief minister has agreed to identify such a piece of land following which a feasibility report would be made ready for presentation to the World Bank, the release said. According to Mr. Sanjoy Sen, the minimum requirement of land for the proposed complex was estimated to be around 200-250 acres which should be located along perennial canal or a small river.

Mr. Sen pointed out to the chief minister that although Calcutta in recent years had emerged as the largest exporter of leather goods in India and contributed around 3% to the total Indian export effort, the lack of a modern sophisticated infrastructure had resulted in Calcutta not being able to attract and retain the attention of serious overseas buyers.

#### LEATHER GOODS EXPORTERS FORM CONSORTIUM

The idea of consortium marketing is catching on among leather exporters. Some garment manufacturers of Madras have already come together in a consortium to make leather garments, particularly in the US. The consortium can project a capacity of at least 20,000 garments per month. The strategy involves sending marketing teams to US and Europe and hiring the services of professional sales agencies abroad. The consortium, a get-together of young professionals, has been inspired by Vam Exports, an existing organisation with about 10 small garment manufacturers under its umbrella.

Mr. M.M. Hashim, chairman of the Council for Leather Exports, commending consortium approach which has been successfully tried out by countries like Japan and South Korea, pointed out that the consortium would be able to present the buyer with substantial capacity, provide a wider range of products, ensure quality consistency and above all avoid unhealthy intra-constituent competition.

#### MEET ON LEATHER WORKERS' PROBLEM IN AUGUST

A conference to discuss the problems of leather workers is being convened during the last week of August by the Karnataka Pradesh Leather Workers' Federation which was set up about a month back.

The president of the federation, Mr. M.R. Ramaiah, told journalists in Bangalore that the conference would be attended by representatives of the International Leather Workers' Association and the All India Leather Workers' Federation. Mr. Haribhai Nayak, Vice-President, ILO (Asia) for leather, textiles and garments, and president of the Rashtriya Mills Mazdoor Sangh, Bombay will deliver the keynote address.

Mr. Ramaiah noted that there were 35 lakh people in the state dependent on this occupation and one lakh directly involved, out of which about 8,000 were working in Bangalore. These workers, he claimed, found it difficult to make profits since they had to pay an exorbitant price for leather. Again, many of them, he said, preferred to do piece-work whereas organisations like the Karnataka Leather Industries' Development Corporation insisted on them taking bulk supplies which they could not afford.

Sevak Publications in Collaboration  
With  
The Indian Chemical Manufacturers Association Announce  
**The Release Of Their  
NEWEST PUBLICATION  
ORGANIC CHEMICALS FROM  
NATURAL SOURCES**

A techno-economic study on the wealth of chemicals  
that the country's rich agro base has to offer.

Price Ps. 100-00 [Postage Rs. 15-00 Extra]

For copies please contact

**SEVAK PUBLICATIONS**

306, Shri Hanuman Industrial Estate,  
G. D. Ambekar Road, Wadala, Bombay-400 031.



# LEATHER NEWS FROM ABROAD

## U.S. IMPORTS DOWN

United States trade statistics released by the Department of Commerce in America show imports of non-rubber footwear down 11.9%. In April 1988, 70.1 million tonnes of non-rubber footwear were imported compared to 79.6 million for the same period in the previous year. April's import figures bring the year-to-date non-rubber footwear total to 316.6 million tonnes, a decline of 7%. This is the fourth consecutive month that imports of non-rubber footwear have declined, reflecting the continued strength of the dollar in the international market. Nevertheless, imports still control 82% of the domestic footwear market.

*Shoe & Leather News*, 3760, 1988.

## UNIDO PLANS FOR AFRICA

Faced with a world shortage of raw materials, the wastage of raw hides and skins in Africa is a tragedy both in leather industry terms and more importantly in lost potential for countries which can ill afford to throw money away. To remedy this situation, UNIDO's US \$20 million scheme for the improvement of hides, skins, leather and leather products in Africa is now ready for implementation. The following is the animal population with target area.

	Target Countries		Whole of Africa	
	Head 10 <sup>6</sup>	Kill 10 <sup>6</sup>	Head 10 <sup>6</sup>	Kill 10 <sup>6</sup>
Bovine	105	9	140	13
Goat	85	24	133	43
Sheep	81	18	131	40

*Leather*, 190, (4557), 98.

## IULTCS XXTH CONGRESS

In October 1989, the American Leather Chemists Association will host the XXth Congress of the International Union of Leather Technologists and Chemists Society in Philadelphia. The general theme of the lectures and poster presentations will be application of science and technology to create fine leather while reducing the quantity of unprofitable by-products.

*Leather*, 190, (4557), 1988.

## NEW LOW CHROME COMPOUND

A recent patent has made it possible to produce leather with physical characteristics comparable to that obtained with chrome at temperatures of over 100°C while using only 0.5% of Cr<sub>2</sub>O<sub>3</sub> and 1% of A 1203 with 3% of bicarboxylic acid.

*Leather*, 190, (4557), 1988.

## HIDE CHILLING TO REPLACE SALTING

France's research institute CTC is working with Cuireurotan in developing hide chilling as an alternative to salting. The project is no longer at the pilot stage. The firm is collecting hides in a refrigerated truck in which they are hung for chilling during transportation for discharge to cold store. The next step in the development is to take the stock to the wet blue. A parallel CTC development is the production of dry white small skins. Chemicals added to the wet-white allow a drying that can later be reversed in less than half an hour.

*World Leather*, 1, (5), 1988.

## PIG SKIN USE SOARING

The growing importance of pig meat and the potentially greater availability of pig skin as a raw material for leather is reflected in a new pig breeding centre opened by the Meat and Livestock Commission. It incorporates some of Europe's most advanced design and technology and has been planned to cope with an anticipated boom in U.K.'s commercial use of pig. The demand has grown at the rate of 20% for the last three years and further expansion is expected over the next few years.

*Shoe & Leather News*, (3751), 1988.

## ITALIAN INNOVATIONS

Italy has as many tanning machinery manufacturers as the rest of the EEC put together. There are about 40, ranging from companies employing less than 10 people up to about 150. Turnovers range from under pounds 500,000 to around pounds 12 million per year. Polyester industry sells over pounds 200 million worth of machinery to the world.

*World Leather*, 1, (4), 1988.



# STATISTICS

## WORLD NON-RUBBER FOOTWEAR IMPORTS: JAN.-JUNE 1987

Country	Quantity (1000 pairs)	Per- cent of Total	Value* \$ mil.	Per- cent of Total	Unit Value \$	Percent change Quan- tity	Value	1986-87** Unit Value
Brazil	53,781	10.6	418.3	12.9	7.78	7.8	9.0	18.2
China	26,277	5.2	40.4	1.2	1.53	80.1	94.5	7.7
France	2,481	0.5	42.9	1.3	17.29	16.8	4.4	14.9
Greece	185	0.0	2.8	0.1	15.14	27.1	6.5	46.0
Hong Kong	16,427	3.3	56.7	1.7	3.45	11.9	14.9	30.2
India	2,540	0.5	17.3	0.5	6.81	95.3	100.3	2.6
Italy	30,530	6.0	430.4	13.2	14.10	30.1	5.4	35.2
Japan	627	0.1	3.4	0.1	5.42	36.2	11.7	38.6
Korea	95,994	47.4	713.6	21.9	7.43	7.7	7.8	0.1
Mexico	3,600	0.7	24.9	0.8	6.80	84.4	58.8	13.9
Philippines	3,540	0.7	9.9	0.3	2.80	7.5	11.0	3.3
Poland	417	0.1	2.8	0.1	6.72	14.8	18.6	4.4
Romania	1,254	0.3	7.7	0.2	6.14	78.9	85.6	3.7
Spain	14,682	2.9	181.3	5.6	12.35	23.4	15.1	10.9
Taiwan	239,999	47.4	1175.1	36.1	4.90	8.5	26.1	16.4
Thailand	3,577	0.7	15.5	0.5	4.33	15.1	19.8	5.7
Yugoslavia	1,181	0.2	12.5	0.4	10.58	39.8	36.6	3.7
Others	8,848	1.7	97.1	3.0	10.97	3.3	2.1	0.1
World Total	505,992	100.0	3251.9	100.0	6.43	2.4	9.4	6.3
Eastern Economic Countries	50,156	10.0	697.5	21.4	13.91	27.5	8.8	25.8
Eastern Block Countries	841	0.2	6.4	0.2	7.61	16.5	11.1	6.5

Customs values imports for consumption. \*\* First half 1986 to First half 1987.  
Source: US Dept. of Commerce, Bureau of the Census and International Trade Administration. (*American Shoe Making*, 362, (4), 1988).

## GERMAN LEATHER INDUSTRY (in mil. DM)

	Shipments	Exports	Imports
Leather Industry	1425	800	1523
Shoe Industry	6194	1247	5348
Leather goods Industry	1900	570	1200

## LEATHER EXPORTS -- INDIA

Exports	1985-86	1986-87	% inc.
Semi-finished Leather	490.72	525.00	6.99
Finished Leather	2881.95	4008.94	39.71
Leather Footwear	330.31	803.83	143.36
Footwear Components	1903.52	2406.92	26.45
Leather Garments	167.22	622.67	272.37
Leather Goods	774.64	825.35	6.55
Saddlery & Harness	76.78	115.05	49.84
Total	6625.14	9307.76	40.49

## FOOTWEAR & LEATHER MACHINERY -- 1987 (in mil. DM)

Tanning Machinery	65.0
Shoe Machinery	253.5
Sewing Machinery	150.0
Shoe replacing Machinery	16.3
Leather goods Machinery	15.6
Total	500.4



# NOTICE

## GUJARAT HEAVY CHEMICALS LIMITED

REGISTERED OFFICE: MISTRY CHAMBERS (6TH FLOOR), KHANPUR, AHMEDABAD 380 001.

FORM IIA

(See Rule 4A (1))

It is hereby notified for the information of the public that M/s. Gujarat Heavy Chemicals Limited proposes to make an application to the Central Government in the Department of Company Affairs, New Delhi, under Section (2) of Section 22 of the Monopolies and Restrictive Trade Practices Act, 1969 for approval to the establishment of a new undertaking. Brief particulars of the proposal are as under:

- (1) Name and address of the applicant : GUJARAT HEAVY CHEMICALS LIMITED  
Mistry Chambers (6th Floor),  
Khanpur, Ahmedabad 380 001.
- (2) Capital Structure of the applicant organisation : Authorised Capital: 100.00 crores  
Subscribed Capital: 72.00 crores  
Paid-up capital: 71.00 crores  
(Equity shares of Rs. 10/ each).
- (3) Management structure of the applicant organisation indicating the names of the Directors, including Managing/Whole-time Directors and Manager, if any : The Company is managed by the Board of Directors  
Names of Directors:  
1) Shri H.R. Patankar -- Chairman  
2) Shri S.K. Shelat -- Director  
3) Shri Sanjay Dalmia -- Director  
4) Shri Anurag Dalmia -- Director  
5) Dr. P.K. Das -- Director  
6) Dr. B.C. Jain -- Director  
7) Shri P.M. Thomas -- Director (Nominee--IDBI)  
8) Shri B.Y. Srinivasan -- Director (Nominee--LIC)  
9) Shri V. Dixit -- Director (Nominee -- IFCI)  
10) Shri K.C. Sharma -- Director  
11) Shri Shobhan M. Thakore -- Director  
12) Shri P.P. Vora -- Director  
13) Shri Y.K. Jain -- Managing Director
- (4) Indicate whether the proposal relates to the establishment of a new unit/division : New Undertaking
- (5) Location of the new Undertaking : Salempur, Dist. Aligarh, U.P.
- (6) Capital structure of the proposed Undertaking : The proposed equity capital of the new undertaking will be Rs. 120 crores.
- (7) In case the proposal relates to the production, storage, supply, distribution, marketing or control of any goods/articles, indicate
- |   | Benzene       | O-xylene    | P-xylene      | Heavy Aromatics |
|---|---------------|-------------|---------------|-----------------|
| (i) Names of goods/articles:                    |               |             |               |                 |
| (ii) Proposed licensed capacity:                | 1,00,000 tons | 35,000 tons | 1,07,000 tons | 7,580 tons      |
| (iii) Estimated Annual turn-over (Rs. in lakhs) | 7,700         | 3,500       | 1,600         | 2,700           |
- (8) In case the proposal relates to the provision of any service, state the volume of activity in terms of usual measure such as value, income turnover etc. : Not applicable
- (9) Cost of the Project : Rs. 600 crores
- (10) Scheme of finance, indicating the amounts to be raised from each source : Equity Capital: Rs. 120.00 crores  
Loan from Financial Institutions etc.: Rs. 480.00 crores  
Rs. 600.00 crores

Any person interested in the matter may make a representation in quadruplicate to the Secretary, Department of Company Affairs, Government of India, Shastri Bhavan, New Delhi, within 14 days from the date of publication of this notice, intimating his view on the proposal and indicating the nature of his interest therein.

for GUJARAT HEAVY CHEMICALS LIMITED

Dated: 30th July 1988

(M.N.K. NAIR)  
COMPANY SECRETARY



# MARKET INFORMATION

## Benzene Shortage Acute

Benzene, an essential output for the dyes, chemical, paint and host of other industries, is in acute shortage. The refineries have not been supplying this item in required quantity. In the meantime HOC plant is also reported to be shut down. The quality of benzene from steel plant was not upto the mark. Toluene and xylene continued to be short. Phenol also moved

up. However, MEK, GH-17 and PVA moved down slightly. Bromine shot up to Rs. 60 and ready goods were not available. Butyl acrylate monomer styrene monomer exhibited lower tendency.

Borax Acid was quoted at Rs. 125. up by Rs. 7 and 8. Meta ureido aniline moved upto Rs. 170. MPD shortage continued. Tobias acid and sul-

We cannot guarantee the accuracy of the prices published in CHEMICAL WEEKLY as they are based only on the enquiries made by our correspondent — and, as such they are not FIRM PRICES as between a buyer and seller. The prices are published only with a view to giving some ideas of market conditions.

The prices are inclusive of Excise and Maharashtra Sales Tax.

pho tobas were also in short supply. Dyes manufacturers are facing acute raw material shortage that is affecting their exports.

(Prices as on 18th August 1988)

INDUSTRIAL CHEMICALS	Per kg				
Ammonium sulphate	2.00	Borax (Granular)	13.50	Calcium Carbonate PPT	3.00
Ammonium phosphate (Mono)	14.50	Borax (Powder)	21.00	Calcium carbonate (Activated)	3.55
Ammonium phosphate (Di)	12.00	Boric acid (Tech.)	22.00	Camphor (Indian)	82.00
Ammonium carbonate (Di)	17.00	Bisphenol-A	71+ST	Cresylic acid	50.00
Ammonium bicarbonate	4.75	Butyl carbitol	48.00	Cream of Tartar (Tech.)	70.00
Ammonium chloride	3.00	Caustic soda (Flakes)	9.20	Citric acid (Belgium) (Resale)	43.00
Ammonium nitrate	3.50	Caustic soda (Solid)	8.00	Citric acid (Indian) (Resale)	42.50
Arsenic white powder	21.00	Caustic soda (Lye)	7.00	Copper sulphate	21.00
Acrylamide (Resale)	88.00	Calcium chloride 70% (solid)	3.25	Chromic acid	48.00
Barium carbonate	6.00	Calcium chloride 75-80% (fused)	3.50	Cyanuric chloride	120.00
Washing powder (33% Cl)	4.00	Calcium chloride 35% (Anhydrous)	5.00	Cobalt oxide	280.00
				Carbitol	60+ST

## Quality Always Pays

USE 'RAM' BRAND ISI MARK

NOW AVAILABLE REGULARLY

# Borax Granular-Crystals—ISI

# Boric Acid

# Copper Sulphate-ISI

MANUFACTURERS

## Ram Agro Chemical Industries (P) Limited

Post Box No. 146,  
MADRAS-600 001

Phones : 517626/518843 Resi. : 30784/39695

Telex : 041-6503 RAM IN



TELEX : 716-213 MORG-IN.



For Your Requirements Of :

SORBITOL  
CITRIC ACID  
PROPYLENE GLYCOL  
GLYCERINE  
PHENOL  
I. P. A.  
HYDROGEN PEROXIDE

TITANIUM DIOXIDE  
M. E. K.  
CYCLOHEXANONE  
METHANOL  
TOLUENE  
BENZENE  
XYLENE

ACETONE  
FORMALDEHYDE  
PARAFORMALDEHYDE  
ETHYL ACETATE  
n-BUTANOL  
CALCIUM CARBONATE

Please Contact :

## RAMSHREE CHEMICALS

330, Samuel Street, 4th Floor, Room No. 402, Bombay-400 003.

Telephone : 329976/333475

For Competitive Import of Pharmaceutical Substances, Chemicals &  
Raw Materials and Particularly the following items :

ERGOT ALKALOIDS  
SULPHONAMIDES  
ANTIBIOTICS  
AMINO ACIDS  
INSECTICIDES  
FUNGICIDES

HERBICIDES  
RODENTICIDES  
REPELLENTS  
PHERMONES  
CARDIAC GLYCOSIDES  
ANTI CANCER DRUGS

LITHOPONE  
RANGOLITE  
POTASSIUM & SODIUM HYDROXIDE  
OXALIC ACID  
ESSENTIAL OILS AND  
AROMATIC PRODUCTS

RUBBER CHEMICALS, CONVEYER BELTS, RUBBER PROCESSING AGENTS

Please Contact Exclusive Representatives of :

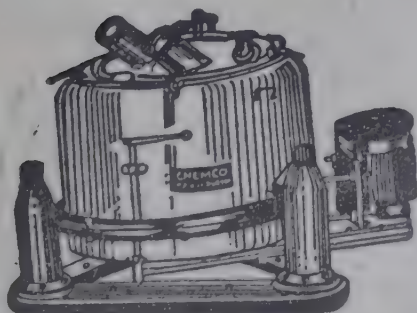
**M/s. CHEMAPOL, CZECHOSLOVAKIA.**

**M/s. N. JIVANLAL & CO. PRIVATE LIMITED**

Rawat Manzil, 2nd Floor, 50, Shamaldas Gandhi Marg, BOMBAY-400 002.  
Tel : 251685/252527/253193      Tlx: 011-3865      Gram : NIRANJAN

## CENTRIFUGES (Hydro-Extractor)

30 c.m. to 150 c.m. dia basket size in MS/SS/SS Lined/RL/RRP Lined



We also Fabricate  
REACTION VESSELS, PRESSURE VESSELS,  
CONDENSORS, STORAGE TANKS, BALL  
MILLS & MS/SS FABRICATION  
CONTACT MANUFACTURERS :

## CHEMO FAB INDUSTRIES

Ram Baug, Behind State Bank of India, S. V. Road  
Chincholi, Malad (West), Bombay-400 064.

Phones : Factory : 6821401/6821695 Resi. : 6821894

Agent For South India — M/S. TECSYS

3. Krishnappa Maletry Street, Woods Road, Madras-600 002. Phone : 849727



Methyl Cresol	45.00
Nitrobenzene	18.00
Nitric Acid (Con.) (RCP)	2.50
Ortho Cresol	30+ST
Phenol (Resale)	38.00
Propylene Glycol	41+ST
Polyethylene Glycol (No. 200)	39.00
Polyethylene Glycol (No. 400)	42.00
Polyethylene Glycol (No. 500)	42.00
Polyethylene Glycol (No. 1600)	14.00
Polyethylene Glycol (No. 4000)	38.00
Polyethylene Glycol (6000)	50.00
Para Cresol	40.00
Styrene monomer	46.+ST
Sorbitol	16.00
Sulphuric Acid	2.10
Trichloroethylene	28.00
Triethanolamine (Resale)	49.00
Turpentine Oil (Germany)	8.00
Turkey Red Oil (50%)	11.75
Triethylamine	50.00
Vinyl Acetate Monomer	43.50
<b>SOLVENTS</b>	
<b>Per Litre</b>	
Benzene	16.00
N-Heptane	8.00
N-Hexane	8.75
Methanol	8.00
Solvent Naphtha Heavy	10.50
Solvent Naphtha Light	8.50
Toluene	17.00
Xylene	18.00

# **DYES INTERMEDIATES (PRICES ARE WITHOUT TAX AND EXCISE)**

Alphanaphthylamine	60.00
Alpha Naphthol (Imp.)	185.00
Aceto Acetic Ester (Methyl)	60.00
Ammonium Molybdate	200.00
Anthraquinone	100.00
Anthranilic Acid	60.00
2-Amino-4-Nitrophenol (Imp.)	140.00
Blue B. Base (Local)	230.00
Beta Naphthol (Atul)	60.00
Benzidine Dihydrochloride (BDH)	80.00
Bromamine Acid	400.00
BON Acid	125.00
Chicago Acid	285.00
Coach Acid	58.00
C. Acid (Imp.)	260.00
Cyanuric Chloride (Japan)	120.00
2, 4, DNCB	29.00
Dihydrothio PTOS (Imp.)	600.00
Dimethyl Aniline	62.00
Diethyl Aniline	155.00
Disulfone disulphonate acid	125.00
3, 3-DCB (Imp.)	180.00
Gamma Acid (Atul)	170.00
H. Acid (Atul)	155.00
G. Salt	61.00
Isophthalic Acid	45.00
J. Acid	260.00
J. Acid Urea	290.00
K. Acid	105.00
MDPS (German)	190.00
MNA	90.00

Meta Unido Aniline	170.00
MPD (Local)	150+Ex.+Tax
MPD (Japan)	220.00
Naphthenic Acid	12.00
N-Methyl J. Acid	380.00
N-Methyl Aniline	120.00
Naphthalene (Refined)	23.00
Ortho Anisidine (OA Imp.)	85.00
Ortho Dichloro Benzene (ODCB)	11.25
OT Base	105.00
Para Dichloro Benzene (PDCB)	17.00
Para Anisidine (PA-Imp.)	110.00
Para Anisidine (PA-Local)	90.00
PNA	70.90
Para Cresidine (Imp.)	335.00
Para Amino Azo Benzene (India)	130.00
PNCB	32.00
Para Amino Acetanilide	145.00
1-Phenyl 3-methyl-5-Pyrazolone	120.00
Phenyl J. Acid	345.00
Para Amino Benzoic Acid	170.00
PT Base	88.00
Rhoduline Acid	500.00
Resist Salt	22.00
Resorcinol	150.00
Sodium Naphthionate	65.00
5-Sulpho-Anthranilic Acid	64.00
Sulphanilic Acid	27.00
Sulpho Tobias Acid	120.00
Trichloro Benzene (TCB)	21.00
Tobias Acid	128.00

NOW AVAILABLE IN ANY QUANTITY,  
AS AND WHEN REQUIRED BY YOU

**MONO-CHLORO  
ACETIC ACID**

When it comes to chemicals, we care a little extra. Making sure to produce chemicals that meet exacting standards of quality, purity and reliability. Backed by research and thorough testing. Our customer service can help you improve your present products and develop new ones. And remember, we can meet your requirement to bulk whenever and wherever you want. Why not try?

We manufacture: N.I.A. • E.D.I.A. • Salt • S.M.C.A. • Sodium Acetate & Hydrochloric Acid.

We market: Acetic Acid • Acetic Anhydride • Butyl & Amyl Alcohol • Ethyl & Butyl Acetate Acetaldehyde • Paraldehyde • D.B.P. • D.E.P.

**ashok organic  
industries Ltd.**

Regd Office: 408 Sharada Chambers,  
33 New Marine Lines, Bombay 400 020.  
Phones: 252235-252268 • Telex: 014-3859

Factory: Nandgaon, Dist. Baroda, Phone: 271-4771



Available Regularly at Most Competitive Rates :

**Furfuryl Alcohol**  
**Propylene Glycol**  
**Epichlorohydrin (incoming)**  
**Isophthalic Acid**  
**Styrene Monomer**

Please Contact :

**Kiran N. Agrawal**

Alankar Bldg., 3rd Floor,  
208, Samuel Street,  
Bombay-400 003.

Phone : 332585/332596/332546

For Your Regular Requirements of Following Products :

**Bulk Drugs :**

**ATENOLOL**  
**CAFFEINE I.P.**  
**DIETHYL CARBAMAZINE CITRATE I.P.**  
**NIFEDIPINE U.S.P.**  
**THEOPHYLLINE ANHYDROUS I.P.**  
**WHITE/YELLOW SOFT PARAFFIN I.P.**

**Drugs Intermediates :**

**CYANO ACETIC ACID**  
**ORTHO NITRO BENZALDEHYDE**  
 **$\alpha$ -PICOLINIC ACID**

Please contact manufacturers :

**TRICHEM LABORATORIES**

11, Lalwani Industrial Estate,  
14, G. D. Ambekar Marg, Wadala,  
BOMBAY-400 031.

Phone : 4123188/4127568

**METHACRYLIC ACID (Gujmet)**

(As per International Standard in Standard Packing at reasonable  
price, continuous supplies assured)

Manufactured By :

**Gujarat State Fertilizers Company Limited., Vadodara**

Marketed By :

**Industrial Trading Agency**

**BRANCH**

**Vadodara-390 001.**  
**Tel. No. : 554690**

**OFFICE :**

**36, Tamarind Lane, Fort, Bombay-400 023.**  
**Tel. Nos. : 272405/270393**

(Inquiries for Acetone Cyanohydrine (GUJACH) and Methyl  
Methacrylate Monomer (GUJMER) for chemical application also  
solicited.)



# Bombay dyes market

(Prices as on 18th August 1988)

ACID COLOUR		Per Kg.						
Acid Violet 4BS		143.00	Brill. Violet Extra		126.40	Scarlet RA		214
Acid Maroon V		110.00	Blue 2B		86.60	Rubine 3B		223
Acid Orange II		77.80	Blue G		170.50	Rubine CB		364
Acid Orange IIY		63.05	Sky Blue FB		188.25	Blue GL		318
Acid Red A		107.25	Copper Blue GR		147.00	Blue BGF		636
Crosein Scarlet MOO		155.00	Fast Greenish Blue GL		114.60	Navy Blue RF		270
Acid Scarlet 3R		99.90	Developed Black BT		116.10	Brown 3REL		200
Acid Red 38N		135.00	Blue NB-2B		300.20	Black GEL		324
Acid Red R2R		132.00	Blue NB-2BC		185.30	Dark Brown 3B		317
Acid Red RS		88.00	Developed Black NB-GHB		185.30			
Acid Green V		230.00	Green B		111.65	BASE COLOURS		
Acid Patent Blue AS		250.00	Green NB-B		188.25	Fast Yellow GC		80
Acid Coomasi Blue		200.00	Green 2B-N		188.25	Fast Orange GC		135
Acid Yellow 5GN		65.00	Brown MR		154.40	Fast Scarlet R		166
Acid Red PG		85.00	Brown CN		107.25	Fast Scarlet RC		126
Acid Red GRS		78.00	Golden Brown G		140.35	Fast Scarlet RCR		99
Acid Black 10 BX		121.95	Catechin G		120.50	Fast Scarlet G		121
Acid Black BX		98.40	Omega Tan		126.40	Fast Scarlet GN		91
Acid Black Wax		135.50	Catechin GS		102.80	Fast Scarlet GG		72
Procinil Yellow GS			Black E Hly Conc.		142.60	Fast Scarlet GGS		72
(ICI, UK)		265.00	Black E Extra Hly. Conc.		142.60	Fast Red B		203
Procinil Red GS (ICI, UK)		530.00	Black NB-ER Hly. Conc.		310.50	Fast Red RC		119
Procinil Blue RS (ICI, UK)		315.00				Fast Red R Flake		149
Procinil Scarlet G			DISPERSOL COLOURS		Per Kg.	Fast Red TR		166
(ICI, UK)		600.00	Yellow 6G Powder		143.80	Fast Red TR Oil		183
Procinil Orange G			Red B 3B Powder		247.80	Fast Red RL		237
(ICI, UK)		250.00	Red B 2B Powder		323.20	Fast Red KB Oil		201
Procinil Rubine (ICI, UK)		550.00	Red CB Powder		439.15	Fast Bordeaux GP		201
			Red D2B Powder		477.40	Fast Garnet GBC		94
DIRECT COLOURS			Violet C 4R		521.90	Fast Violet B		505
Yellow 3GX		88.10	Blue BG Powder		235.45	Fast Blue BB		521
Gun Yellow RCH		124.00	Blue BN Powder		103.75			
Fast Yellow GCH		141.15	Blue D 2R Powder		476.25	NAPHTHOL COLOURS		
Yellow CFG Hly. Conc.		812.00	Navy BT Powder		243.90	ASG		217
Fast Yellow GS		111.65	Blue B 2G Powder		210.20	AS		143
Fast Yellow CHRS		95.45	Black BT Powder		182.60	ASSW		279
Viscose Orange A		166.15	Blue BR Powder		390.20	ABBS		189
Fast Orange GR		133.75	Yellow 7GL		338.60	ASBO		195
Red		96.90	Yellow 5RX		218.80	ASD		175
Dark Tan		78.25	Yellow 3G		367.25	ASOL		179
Red IIR		72.55	Yellow AL		140.00	ASTR		279
Red 4B		169.10	Yellow Brown REL		135.30	ASPH		279
Bordeaux BW		132.30	Yellow FFL		463.60	ASF		196
Fast Scarlet 4BS		166.55	Gold Yellow GG		259.70	ASFI		184
Red 12B		170.55	Pink REL		247.00	ASLB		1632
Bordeaux Hly. Conc.		194.00	Red REL		468.65	ASBT		1817
Cotton Red N		117.05	Red 2B		327.40	ASWG		143
Brill. Fast Helio B		278.00	Red FB		324.20	ASSG		397
Brill. Fast Helio 2B		297.00	Red Violet FBL		469.85	ASSR		480
Brill. Fast Helio 2RS		136.20	Orange 3R		196.65			
Brill. Fast Helio BS		116.10	Violet 3R		280.00			
			Violet RL		275.45			
			Violet 6R		485.75			



COLOURS	Per Kg.				
den Yellow HR	181.80	Navy Blue M 3R	310.95	Blue R Conc. Pdr. Fine	577.65
l. Yellow H4G	117.85	Brill. Blue MR	331.70	Blue RR Supra Powder	629.35
ra Yellow H-8GP	168.55	Brill. Blue M RX	214.20	Blue Conc. Powder	645.80
l. Yellow HE6G	166.95	Brill. Blue M-G	382.30	Brill. Blue 2R Hly. Conc.	378.55
low H-E4R	276.05	Blue M 4GD	344.60	Brill. Blue 2R Supra Disp.	115.65
l. Yellow H7G	332.30	Navy Blue M RB	318.75	Dark Blue 2R Powder Fine	389.25
low M4R	243.95	Turquoise M-G	197.85	Blue BC Supra Disp.	359.40
low M GR	326.05	Brill. Blue M GX	302.50	Jade Green XBN Powder Fine	438.20
l. Yellow M4G	177.10	Blue 3R Acra Powder	718.20	Jade Green XBN Acra	
l. Yellow M8G	332.30	Dark Brown H 6R	248.45	Conc. Powder	823.99
low M 3R	217.80	Cobalt Oxide (per kg.)	285.00	Jade Green 2G Pdr. Fine	419.65
l. Orange H 2R	241.85	Green H 4BD	269.80	Jade Green 2G Ptg. Paste	125.40
l. Red H 7B	157.95	Green H-E4BI	169.80	Jade Green XBN Ptg. Paste	126.00
l. Orange M 2R	313.15	Red Brown H 17	143.25	Jade Green 2G Supra Disp.	496.00
l. Red H 8B	169.45	Orange Brown H 28	209.05	Olive Green B Pdr. Fine	399.90
l. Scarlet H RN	245.05	Brown M GRN	188.80	Olive D Pdr. Fine	444.30
upra Red H-3BP	179.30	Black H-N	283.35	Olive Green B Supra Disp.	308.20
l. Red H-F3B	243.45			Jade Green XBN Supra	
l. Magenta HB	167.00	<b>SULFUR COLOURS</b>	<b>Per Kg.</b>	Disp. (N)	327.30
l. Red M 5B	98.90	Navy Blue	99.85	Olive OMW Pdr. Fine	698.55
l. Red M 8B	173.70	Green G	198.55	Olive OMW Supra Disp.	538.05
l. Pink MB	137.10	Black Grains Extra	63.05	Olive R. Pdr. Fine	422.96
l. Magenta MB	121.55	Black Grains OG	64.55	Olive D Supra Disp.	361.70
l. Purple H-3R	180.20	Black GXE Conc.	61.60	Olive R Supra Disp.	363.90
l. Purple H-7R	175.40	Black GXE	52.75	Olive D. Ptg. Paste	193.00
avy Blue H 3R	298.50	Black GXR	61.60	Olive Green B. Ptg. Paste	199.10
l. Blue H-GR	366.55	Black Grains 800	54.20	Olive Green B Acra Conc.	542.75
l. Blue H 5G	173.10	Black EXR Grains	64.55	Olive R Acra Conc.	640.00
l. Blue H 5R	283.85	Black EXR Grains 800	51.25	Olive Green B Acra Conc.	542.75
l. Blue H 7G	178.70			Brown R Pdr. Fine	835.00
l. Blue H 7RX	358.15	<b>VAT COLOURS (ICI)</b>	<b>Per Kg.</b>	Brown G. Pdr. Fine	795.00
urquoise HA	234.45	Yellow 5G Powder Fine	673.15	Brown R Pdr. Fine	659.75
upra Blue H-3RP	335.70	Yellow 5G Supra Disperse	439.30	Dark Brown 3R Pdr. Fine	685.00
upra Turquoise H 10P	181.50	Yellow 5G Acra Com.	628.75	Brown G. Supra Disp.	449.90
Blue H-ERD	305.80	Yellow 3R Powder	588.85	Brown 2G Supra Disp.	554.00
Wavy Blue H ER	258.60	Gold Orange 3G Pdr. Fine	952.15	Brown R Supra Disp.	422.95
Blue H 5RX	269.30	Brill. Orange 6R Pdr. Fine	624.35	Brown BR Powder	719.00
		Gold Orange 3G Supra Disp.	601.30	Dark Brown 3R Ptg. Paste	217.15
		Brill. Orange 6RX Powder	394.30	Dark Brown 3R Supra Disp.	414.55
		Brill. Red 3B Pdr. Fine	997.80	Dark Brown 3R Supra Disp.	414.55
		Brill. Red 3B Supra Disp.	713.20	Brown G Acra Conc.	733.95
		Brill. Purple 4R Conc. Pdr.	470.75	Brown R Acra Conc.	766.00
		Brill. Purple 3R Acra Powder	690.85	Grey M. Powder Fine	766.80
		Brill. Purple 2R Hly Conc.	597.90	Grey M. Supra Disp.	585.45
		Brill. Purple 4R Supra Disp.	500.05	Blue BC Acra Conc. Pdr. Fine	762.76
		Brill. Purple 2R Acra Conc.	625.95	Direct Black AC Supra Disp.	330.35
		Blue R Powder Fine	542.15	Direct Black AC Pdr. Fine	474.76
		Blue BC Conc. Pdr. Fine	522.50	Direct Black CH Supra Disp.	393.20
		Blue BC Acra Conc. Pdr. Fine	762.76	Direct ACD Ptg. Paste	217.16



## Madras Market

Moderate conditions prevailed in the market. There was brisk activity in items like Bleaching Powder, Caustic Soda, Soda Ash etc. There was good purchasing of Bleaching Powder and other Sanitation Chemicals by Public Health authorities to check the out

break of infectious diseases. The Benzene/Toluene shortage is assuming serious proportions resulting in closure of factories including HOC Cochin Phenol plant, affecting exports of Phenol.

### (MADRAS MARKET RATE AS ON AUGUST 20, 1988)

Acetic Acid Glacial (per kg)	18.75	Hydrosulphite of Soda — TCPL (per kg)	40.00
Aluminium Sulphate Iron Free (per MT)	1800.00	Hydrosulphite of Soda — IDI (per kg)	42.00
Ammonium Bicarbonate (per 25 kg)	125.00	Hydrosulphite of Soda — BASF (per kg)	44.00
Acid Slurry Soft (per kg)	27.00	Hydrogen Peroxide (per kg)	30.00
Ammonium Chloride SPIC (per MT)	2,800.00	Hyflo Supercell (per kg)	19.50
Bleaching Powder (per 25 kg bags)	110.00	Magnesium Carbonate (per kg)	18.00
Borax Granular (per 50 kg)	650.00	Potassium Bichromate (per kg)	26.00
Caustic Soda Flakes — Mettur Chemicals (per MT)	8,600.00	Phosphoric Acid (per kg)	19.00
Caustic Soda Flakes — Andhra Sugars (per MT)	8,600.00	Phthalic Anhydride (per kg)	24.00
Citric Acid (per kg)	48.00	Pentaerythritol (per kg)	52.00
Copper Sulphate (per 50 kg)	1000.00	Paraffin Wax (per kg)	13.50
Cresylic Acid 98/99% (per kg)	87+ED	Oxalic Acid (per kg)	24.00
Meta Cresol 40/42% (per kg)	39+ED	Soda Ash — TAC (per 75 kg bags)	320.00
Para Cresol 80/85% (per kg)	67+ED	Soda Ash — TATA (per 75 kg bags)	325.00
Formic Acid (per kg)	27.00	Sodium Cyanide Indian (per kg)	55.00
Formaldehyde (per kg)	9.00	Sodium Cyanide (Degussa) (per kg)	80.00
Glycerine (per kg)	52.00	Sodium Bichromate (per kg)	20.00
		Sodium Bicarbonate (per 50 kg bags)	290.00
		Sodium Nitrate (per 50 kg bags)	450.00

Sodium Nitrite (per 50 kg bags)	750.00
Sodium Silicate (per MT)	4500.00
Sodium Sulphate (per MT)	3200.00
Sodium Sulphide Flakes (per MT)	12000.00
Sodium Bisulphite (per 50 kg)	4,000.00
Stearic Acid (per kg)	30.00
Trisodium Phosphate (per 50 kg)	350.00
Titanium Dioxide — Indian TTP — (per kg)	49.00
Titanium Dioxide — Indian (Rutile) (per kg)	58.00
Urea Tech (per MT)	2800.00
Zinc Oxide (per kg)	34.00
Zinc Chloride Powder (per kg)	13.00

Zinc Sulphate (per MT)	4,500.00
Di-octyl Phthalate (per kg)	42.00
Di-butyl Phthalate (per kg)	42.00
Hexamine (per kg)	34.00

### SOLVENTS

Acetone — HOCL — (per kg)	18.75
Acetone — NOCIL — (per kg)	22.00
Diacetone (per kg)	29.50
Diethylene Glycol (per kg)	48.00
Isopropyl Alcohol (per kg)	22.00
Butanol (per kg)	34.00
Benzene — SAIL — (per lit.)	18.00
Toluene — SAIL (per lit.)	17.00
Xylene — SAIL — (per lit.)	18.00
Phenol — HOCL — (per kg)	28.00
Turpentine (per lit.)	16.50
Trichloroethylene — MCIC — (per kg)	23.50
Carbon Tetra Chloride (per kg)	16.00
Chloroform (per kg)	26.00
Methylene Chloride (per kg)	25.00
Methanol (per kg)	11.00
Methyl Ethyl Ketone (per kg)	52.00
Cellosolve (per kg)	50.00
Butyl Acetate (per kg)	40.00
Ethyl Acetate (per kg)	23.00
Triethanolamine (per kg)	24.00
Sorbitol (per kg)	35.00



## Delhi Market

**DELHI : AUGUST 19, (NNS) —** Menthol prices went up sharply by Rs. 0/20 (per kg.) in the Delhi chemicals market during past week, on brisk and bulk purchasing by exporters and stockists, reports NNS. Ammonia bicarb, titanium, paraffin wax also showed an upward trend whereas Hexamine suffered a steep fall of Rs. 8 on easy supply. Turnover was moderate over the week caused by heavy rains during the week.

On account of limited inflow from J.P. along with heavy demand shown by the stockists of Delhi and exporters of Bombay, Menthol bold went up sharply by Rs. 20 at Rs. 285 (per kg.). A rise of Rs. 50 (per kg.) was reported in Menthol bold within two or three weeks. Menthol medium advanced from Rs. 255 to Rs. 265 and flakes flared up at Rs. 236 against Rs. 222 on acute shortage of stocks. Menthol oil moved up from Rs. 175 to Rs. 192 and DMO remained static at Rs 102 per kg.

In the absence of fresh inflow from Kerala and increased demand by stock-

kists, titanium dioxide Anatase and RC-822 appreciated by Rs. 1/2 at Rs. 57 and Rs. 76 (per kg.) respectively and good demand by paint units.

Ammonia bicarb marked up further by Rs. 5 at Rs. 140 (per 25 kg.) on account of good demand from Haryana, Punjab and West Bengal induced by tight supply position. Paraffin wax recorded a gain of Rs. 10 at Rs. 650 in the absence of arrivals from Assam due to flood. Formaldehyde moved up by Rs. 1 at Rs. 9 (per kg.) on tight supply.

Hexamine, however suffered a sharp decline of Rs. 8 at Rs. 34 (per kg.) in the absence of demand by industrial units as well as comfortable supply.

Sodium hydro sulphite Gulshan softened from Rs. 38 to Rs. 37 on thin trading. Mercury citric acid, tartaric acid, soda ash and soda bicarb prices hovered around at their last week levels.

Dyes and colours also ruled quiet in the absence of demand due to rainy weather.

### (DELHI MARKET RATES AS ON AUGUST 19, 1988)

Ammonia Bicarb (per 25 kg)	140.00
Mercury (per flask)	11,000.00
Soda ash (per bag)	270-300.00
Ammonium chloride (per 50 kg)	125-180.00
Caustic soda solid	No Stock
Caustic soda flakes (per 50 kg)	398-400.00
Citric acid (per 50 kg)	2100-2400.00
Stable Bleaching Powder Shriram (per 25 kg)	95.00
Stable Bleaching Powder KCI (per 25 kg)	86.00
Stable Bleaching Powder MODI (per 25 kg.)	88.00
Sod. Bicarbonate (per 50 kg)	265-275.00
Sod. Hydro Sulphite (per kg)	37-43.00
Rangolite (per kg)	50-70.00

Boric acid Technical (per 50 kg)	1025.00
Paraffin wax (per 50 kg)	650.00
Tartaric acid (per 50 kg)	6,000.00
Borax Granular (per 50 kg)	565.00
Borax Crystal (per 50 kg)	580.00
Sodium Nitrate (per 50 kg)	430.00
Sodium Nitrite (per 50 kg)	675-700.00
Camphor Powder (per kg)	88.00
Camphor Thal (per kg)	102.00
Menthol Medium (per kg)	265.00
Menthol Flakes (per kg)	236.00
Menthol Bold (per kg)	285.00
Glycerine (per kg)	47-48.00
Sodium Silicate (per quintal)	200-250.00
Hexamine (per kg)	34.00

Acetic Acid Glacial (per kg)	14.50-17.00
Copper Sulphate (per quintal)	2100-2300.00
Formic acid (per kg)	26.00
Formaldehyde (per kg)	9.00
Hydrogen Peroxide (per kg)	27-29.00
Calcium Carbonate (per tonne)	2500-4000.00
Acid Slurry Soft (per kg)	24.00
Acid Slurry Hard (per kg)	32.00
Phosphoric Acid (per 50 kg)	900.00
Pot. Nitrate (per quintal)	900-1200.00
Pot. Permanganate (per 50 kg)	2300.00
Sod. Bichromate (per 50 kg)	1050-1150.00
Tri-Sod. Phosphate (per 50 kg)	350-380.00
Titanium Dioxide Anatase (per kg)	57.00
Titanium RC-822 (per kg)	76.00
Zinc Oxide (per mt)	35,000-42,000.00
Phenol Carbolic Acid (per kg)	33.00
Carbon Tetrachloride (per kg)	20.00
Chloroform (per kg)	28.00
Sodium Sulphate (per 50 kg)	160-170.00
Naphthalene Balls (per 50 kg)	1350.00
<b>DYES &amp; COLOURS (per kg)</b>	
Naphthol AS	158.00
Naphthol ASG	249.00
Naphthol ASBS	210.00
Naphthol ASTR	320.00
Naphthol ASOL	202.00
Naphthol ASBO	220.00
<b>DIRECT DYES (per kg)</b>	
Black E. Conc.	110-160.00
Diazo Black MT	105-130.00
Green B	100-127.00
Blue 2-B	60-92.00
Sky Blue FB	213.00
Basic Auramine	55-110.00
Basic Rhodamine	220-320.00
Basic Methylene Blue	92-130.00
Basic Violet	142-160.00
Basic Malachite Green	140-165.00
Acid Orange	45-88.00



# MATERIALS IMPORTED

(Contd. from the previous issue)

## BOMBAY

(From 22-2-88 to 29-2-88)

**SODIUM 2 ETHYL HEXANOATE:** From UK: Ranbaxy Laboratories Ltd., 1,000 kgs., Rs. 66,864.

**SODIUM GLUCONATE POWDER:** From Netherlands: Grauer & Weil (India) Ltd., 2,000 kgs., Rs. 37,651.

**SODIUM METHOXIDE:** From FRG: Hindustan Lever Ltd., 1,000 kgs., Rs. 51,739.

**SODIUM NITRITE:** From FRG: Indian Dyestuff Ind. Ltd., 21,000 kgs., Rs. 1,14,734.

**EPICHLORO HYDRINE:** From Japan: M. J. Exports P. Ltd., 15,840 kgs., Rs. 3,49,612.

**SOYA LECITHIN:** From Brazil: Britannia Inds. Ltd., 15 kgs., Rs. 99,321; Jenson & Nicholson India Ltd., 5,000 kgs., Rs. 34,471; From FRG: Fluid Air India Pvt. Ltd., 17 Mts., Rs. 1,12,565; Nisha Plast Inds., 34 Mts., Rs. 2,25,130; From Japan: Cornstram Steel, 17 Mts., Rs. 1,12,565.

**STEMONE:** From Switzerland: Mysorewala Sugandhit Dhoop Factory, 25 kgs., Rs. 11,071.

**SUCRALFATE:** From China: Lupin Labs Ltd., 500 kgs., Rs. 68,487.

**SULPHURIC ACID:** From France: Shivalik Bimetal Controls Ltd., 1,620 lbs., Rs. 16,840.

**SULPHUR INSOLUBLE:** From FRG: Modi Rubber Ltd., 16,000 kgs., Rs. 4,73,539.

**SULPHUR INSOLUBLE:** From Japan: Bombay Boat Builders & Co., 5,000 kgs., Rs. 68,162.

**SYNTHETIC RESIN:** From Japan: Chetrai Polycoats Pvt. Ltd., 2,000 kgs., Rs. 39,988; From

UK: Snowcem India Ltd., 39.2 Mts., Rs. 6,15,466; From USA: Eagle Plastic Pvt. Ltd., 12,727 kgs., Rs. 3,69,132; Mansukhlal & Co., 172.37 kgs., Rs. 11,819; Poonam Plastic Inds., 40 Mts., Rs. 1,97,346.

**TEREPHTHALIC ACID PURE:** From UK: Reliance Inds. Ltd., 2,000 Mts., Rs. 1,49,63,430.

**TETRA HYDROXY PARAMETHYL QUINOLINE:** From Switzerland: Mysorewala Sugandhit Dhoop Factory, 1 kg., Rs. 1,359.

**THIOUREA:** From Japan: Eagle Chemical Works, 1,000 kgs., Rs. 24,668; From Japan: Industrial Trading Co., 1,425 Mts., Rs. 32,932; Parth Laboratories Pvt. Ltd., 1,000 kgs., Rs. 24,668.

**TITANIUM DIOXIDE:** From Japan: Wellknown Tools & Equipments, 17,000 kgs., Rs. 4,63,501; From USA: Chemicals De Universe P. Ltd., 17 Mts., Rs. 5,18,681; U.K. Paint Inds., 68 Mts., Rs. 17,56,893.

**TITANIUM DIOXIDE RUTILE:** From Belgium: The National Leather Cloth Mfg., 18,000 kgs., Rs. 5,35,170; From France: Burroughs Wellcome (India) Ltd., 9 Mts., Rs. 2,47,134; Uptron Capacitors Ltd., 9 Mts., Rs. 2,47,134; From Japan: Garware Paints Ltd., 17,500 kgs., Rs. 4,65,774; Shriram Honda Power Equipment, 15,607 Mts., Rs. 4,48,818; Unilok Adhesives & Chemicals Ltd., 250 kgs., Rs. 14,444; From UK: Sigma Paints Ltd., 20,000 kgs., Rs. 5,72,561; From USA: Asian Paints India Ltd., 2,04,000 kgs., Rs. 52,309,952; Bheda Bros., 15,607 Mts., Rs. 4,48,818.

**TOLUENE DI ISOCYANATE:** From Belgium: Leo Templen In-

sulation Pvt. Ltd., 5,500 kgs., Rs. 1,53,527.

**TRIETHYLAMINE:** From USA: Tata Exports Ltd., 3,039.1 kgs., Rs. 65,696.

**TRIETHYL PHOSPHATE:** From FRG: IDI, 3,080 kgs., Rs. 1,35,510.

**3,4,5 TRIMETHOXY BENZALDEHYDE:** From China: Suchem Laboratories, 1,000 kgs., Rs. 2,85,631.

**TRIMETHOXY BENZALDEHYDE:** From Japan: 1,020 kgs., Rs. 31,208/44 Sieves Manufacturers, 1,000 kgs., Rs. 2,75,894.

**3,4,5 TRIMETHOXY BENZALDEHYDE:** From Poland: Curefast Drugs & Intermediates, 100 kgs., Rs. 3,44,056.

**TRIMETHOXY BENZALDEHYDE:** From Romania: The S.T.C. of India Ltd., 1,000 kgs., Rs. 2,75,894.

**3,4,5 TRIMETHOXY BENZALDEHYDE:** From Saudi Arabia: Grover Overseas P. Ltd., 500 kgs., Rs. 1,52,554.

**TRIMETHYLOL PROPANE:** From Sweden: Goodlass Nerolac Paints Ltd., 13,000 kgs., Rs. 2,95,369.

**2,2,4 TRIMETHYL 1,3 PENTANE DI ISOBUTYRATE:** From Japan: Vijay Cable Inds., 15,200 kgs., Rs. 2,04,252.

**VANILLIN:** From Switzerland: The Bharat Indl. Corpn., 30 kgs., Rs. 14,086.

**VINYL ACETATE MONOMER:** From USA: Cibatul Ltd., 16,872 kgs., Rs. 2,38,768.

**VINYLDIENE FLUORIDE:** From USA: Sy Engineering Corpn., 100 kgs., Rs. 22,941.

**VINYL RESIN:** From USA: C. J. Shah & Co., 2,250 lbs., Rs. 43,818; C. J. Shah & Co., 2,250 lbs., Rs. 55,503.

**XYLENES:** From Australia: The Raymond Woollen Mills Ltd., 288 kgs., Rs. 9,130.



August 30, 1988

XYLIDINE: From Switzerland: 2,000 kgs., Rs. 1,30,488; Unity Colour Chem. Ltd., 5,000 kgs., Rs. 44,084.  
2,6 XYLIDINE: From Switzerland: Mahendra Chemicals, 1,200 kgs., Rs. 1,50,974.

PENICILLIN G POTASSIUM: From UK: Hindustan Antibiotics Ltd., 10,800 kgs., Rs. 27,69,979.

PHENOL USP: From Japan: Aia Laboratories Pvt. Ltd., 50,000 kgs., Rs. 6,16,704; From Japan: S. D. Fine Chem Pvt. Ltd., 16,000 kgs., Rs. 2,07,732.

POLYSORBATE 60: From Switzerland: Parke Davis (India) Ltd., 3,000 kgs., Rs. 96,623.

POVIDONE IODINE USP: From USA: Wockhardt Ltd., 4,500 kgs., Rs. 3,05,723.

PROPYLENE GLYCOL USP: From Singapore: Lupin Laboratories Pvt. Ltd., 17.2 kgs., Rs. 1,89,817; M. J. Exports Pvt. Ltd., 16,770 Mts., Rs. 1,80,716; Revex Plasticisers P. Ltd., 8,600 kgs., Rs. 94,908; From USA: Mahindra & Mahindra Ltd., 41,925 kgs., Rs. 4,46,345.

PYRAZINAMIDE BP/USP: From Korea: Lupin Laboratories Ltd., 500 kgs., Rs. 2,50,576.

PYRAZINAMIDE: From Korea: Lupin Labs. Pvt. Ltd., 500 kgs., Rs. 2,59,341.

PYRIDOXINE HYDROCHLORIDE USP: From Japan: Bombay Pharma Products, 400 kgs., Rs. 1,86,959.

SODIUM D PANTOTHENATE: From Japan: Parke Davis India Ltd., 250 kgs., Rs. 99,908.

SULPHADIAZINE IP/BP: From China: Pharmpak Pvt. Ltd., 2,000 kgs., Rs. 5,19,330.

TARTARIC ACID BP/USP: From FRG: Cadia Laboratories P. Ltd., 18,000 kgs., Rs. 6,49,019.

THEOPHYLLINE MONOHYDRATE: From USSR: Torrent Exports Pvt. Ltd., 2,000 kgs., Rs. 1,41,050.

VITAMIN B6 USP: From Japan: UNI UCB Ltd., 250 kgs., Rs. 1,19,771.

## DRUGS MATERIALS IMPORTED

### BOMBAY

(From 16.2.88 to 29.2.88)

D-ALPHA PHENYL GLYCINE CHLORIDE HYDROCHLORIDE: From Netherlands: Ranbaxy Laboratories Ltd., 12,075 kgs., Rs. 34,96,031.

AMIDOTRIZOIC ACID USP: From FRG: German Remedies Ltd., 2,035.2 kgs., Rs. 13,85,562.

AMPICILLIN TRIHYDRATE: From Netherlands: Ranbaxy Laboratories Ltd., 2,000 kgs., Rs. 16,19,011.

AMPROLIUM HCL: From USA: Prapul Vitamins, 200 kgs., Rs. 68,811.

BETAINE BASE MONOHYDRATE: From FRG: U.S. Vitamins (India) Ltd., 640 kgs., Rs. 77,096.

CALCIUM D PANTOTHENATE USP: From Japan: Bombay Pharma Products, 500 kgs., Rs. 87,637; E. Merck India Ltd., 600 kgs., Rs. 1,09,059.

CHLOROFORM BP: From FRG: Unique Pharmaceuticals Lab., 16.38 Mts., Rs. 2,13,543.

CITRIC ACID BP 80: From China: G. Amphray Laboratories, 35 Mts., Rs. 5,63,472.

CITRIC ACID MONOHYDRATE BP: From China: Lyka Laboratories Pvt. Ltd., 350 kgs., Rs. 6,816; Kapi Chem Dye., 17.5 Mts., Rs. 2,94,235; From China: Meena Chemical Inds., 20 Mts., Rs. 3,36,266; Samir Trading Corpn., 35 Mts., Rs. 5,88,466.

CREATININE: From Australia: Cadila Laboratories Pvt. Ltd., 60 kgs., Rs. 72,879.

ERYTHROMYCIN THIOCYANATE: From Italy: Sumedha Chemicals, 1,337.55 kgs., Rs. 10,67,872.

LACTOSE BP/USP/IP: From Netherlands: Searle (India) Ltd., 5,000 kgs., Rs. 62,404.

L-LYSINE MONO HCL USP: From Japan: N. R. Jet Pharmaceuticals Ltd., 400 kgs., Rs. 25,966.

MANNITOL USP/BP: From Australia: Tata Exports Ltd., 1,000 kgs., Rs. 23,370.

MANNITOL USP PYROGEN FREE: From Brazil: Hindustan Ciba Geigy Ltd., 7,000 kgs., Rs. 1,49,957; Sarabhai Chemicals, 2,000 kgs., Rs. 45,124.

MEGLUMINE BP/USP: From FRG: German Remedies Ltd., 500 kgs., Rs. 1,31,541.

METHYL SALICYLATE BP: From France: Bombay Drug House Ltd., 1,000 kgs., Rs. 40,577.

NALIDIXIC ACID USP: From UK: Win Medicare Ltd., 750 kgs., Rs. 6,43,865.

NOVALDIAMINE: From FRG: IPCA Labs Pvt. Ltd., 1,980 kgs., Rs. 6,25,317.

PANCREATIN IP: From FRG: Hoechst India Ltd., 5,000 kgs., Rs. 23,832.90.

PARACETAMOL BP: From China: Inca Laboratories Pvt. Ltd., 850 kgs., Rs. 73,387.



## Plastic Materials Imported

### BOMBAY

(From 16.2.88 to 19.2.88)

**COPOLYMER OF ETHYLENE AND METHACRYLIC ACID:** From USA: BSSEC Packaging Ltd., 268 kgs., Rs. 61,670.

**HIGH IMPACT POLYSTYRENE:** From Korea: Bright Bros. Ltd., 25 Mts., Rs. 4,70,643.

**HDPE:** From Czechoslovakia: Associated Bros., 37.5 Mts., Rs. 3,45,699; Associated Plastic Industries, 100 Mts., Rs. 9,21,864; Hardik Indl. Corporation, 75 Mts., Rs. 6,91,398; From Malaysia: Adinath Narrow Fabrics P. Ltd., 17.150 Mts., Rs. 2,31,569; From Saudi Arabia: Maruti Plastic Inds., 51.450 Mts., Rs. 6,27,909; Minocha Button Stores, 17.150 Mts., Rs. 2,10,416; Plastic Processors, 34.30 Mts., Rs. 4,47,552; From Taiwan: Bahar Plastics Ltd., 200 Mts., Rs. 32,76,185; From Yugoslavia: Vee Pee Finance Pvt. Ltd., 100 Mts., Rs. 10,81,012.

**HDPE BLOW MOULDING GRADE:** From Czechoslovakia: Kalpesh Plastic Inds., 125 Mts., Rs. 11,52,330.

**HDPE INJECTION MOULDING GRADE:** From Saudi Arabia: Chemofine Corporation, 49.400 Mts., Rs. 5,80,868.

**HDPE RESIN GRADE:** From Singapore: Giltpack Ltd., 99,000 kgs., Rs. 12,72,488.

**LDPE:** From Czechoslovakia: Unnati Packaging Inds., 15 Mts., Rs. 1,13,344; From FRG: Finolex Cables Ltd., 49.5 Mts., Rs. 6,10,537; Siemens Ltd., Rs. 49.5 Mts., Rs. 6,10,536; From FRG: Siemens Ltd., 49.5 Mts., Rs. 6,10,536; From Yugoslavia: Pearl Plast International, 25 Mts., Rs. 3,09,241; Ravi International, 60 Mts., Rs. 7,42,800.

**LLDPE:** From Czechoslovakia: Unnati Packaging Inds., 1.5 Mts., Rs. 1,13,344; From Saudi Arabia: Indian Petrochemicals Corp. Ltd., 1,287.00 Mts., Rs. 1,85,02,675; Jamnadas Murlidhar Jaisingh, 24.750 Mts., Rs. 3,06,875.

**LLDPE RESIN:** From USA: Ecoplast P. Ltd., 16 Mts., Rs. 2,13,964.

**PHTHALIC PLASTICIZERS:** From Korea: Caprihans India Ltd., 48,600 kgs., Rs. 6,77,532.

**POLYETHYLENE:** From France: Industrial Cables India Ltd., 19.2 Mts., Rs. 3,42,758; From Singapore: Hari Vishnu Packaging Ltd., 33 Mts., Rs. 4,28,447; From Sweden: Vindhya Telelinks Ltd., 202.5 Mts., Rs. 29,89,065.

**POLYETHYLENE RESIN:** From Canada: Bharat Vijay Mills Ltd., 74.250 Mts., Rs. 8,89,778.

**POLYPROPYLENE:** From Czechoslovakia: Naresh Paper Bag Co., 14 Mts., Rs. 1,62,208; Valia Impex P. Ltd., 14 Mts., Rs. 1,62,208; From France: Gujarat Propack Ltd., 30,000 kgs., Rs. 13,96,997; From Italy: Caprihans India Ltd., 30 Mts., Rs. 5,21,928; From Singapore: Diamond Polyplast Pvt. Ltd., 16 Mts., Rs. 2,88,747; Richardson Hindustan Ltd., 16 Mts., Rs. 2,92,902; From USA: Creative Plastic Inds., 99.525 Mts., Rs. 12,92,158; Furn Plastic Inds. Ltd., 12.5 Mts., Rs. 2,28,113; Sanghvi Hardware Stores, 20.411 Mts., Rs. 2,91,501.

**POLYPROPYLENE FILM GRADE:** From Singapore: Fraternity Electronics Ltd., 16,000 kgs., Rs. 2,78,361.

**POLYPROPYLENE INJ. GRADE:** From USA: Gujarat Plastic Inds., 42,070 kgs., Rs. 4,36,964.

**POLYPROPYLENE RESIN:** From Korea: Sanghvi Filaments

Pvt. Ltd., 3 Mts., Rs. 44,143.

**POLYSTYRENE:** From Mexico

Lucky Plastic, Rs. 1,43,371.

**POLYSTYRENE RESIN:** From Korea: Steriplate Pvt. Ltd., 51 Mts., Rs. 9,53,158.

**POLYTETRAFLUOROETHYLENE:** From Japan: Space Application Cables, 1,000 kgs., Rs. 1,39,570.

**PVC RESIN:** From Japan: Phiroze Sethna Pvt. Ltd., 3.5 Mts., Rs. 1,01,959; From Mexico: Prakash Pipes & Inds. Ltd., 100 Mts., Rs. 12,11,460; From Yugoslavia: Ajay Indl. Corporation, 10,000 kgs., Rs. 1,14,560; Jain Bros. Industries, 946 Mts., Rs. 1,18,37,905.

**PVC RESIN SUSPENSION GRADE:** From Romania: Usha Chemical Inds., 100 Mts., Rs. 12,22,601.

**PVC MASS POLYMER GRADE:** From Yugoslavia: Jain Tube Co. Ltd., 325 kgs., Rs. 42,76,426; Premier Vinyl Flooring Ltd., 100 Mts., Rs. 13,14,935.

**PVC STABILISERS:** From FRG: Lightcraft Corporation, 2,860 kgs., Rs. 2,84,300.

### BOMBAY

(From 22.2.88 to 29.2.88)

**HDPE:** From Belgium: Plastic Processors, 84.925 Mts., Rs. 11,28,870; Polyplast Pvt. Ltd., 32.825 Mts., Rs. 4,36,329; From FRG: Jindal Stripes Ltd., 24,750 kgs., Rs. 3,22,942; From Japan: Maniyal Packaging Pvt. Ltd., 33 Mts., Rs. 4,32,730; Raj Kamal Plastics Pvt. Ltd., 32.45 Mts., Rs. 4,87,215; Suresh C. Doshi, 16 Mts., Rs. 1,81,765; From Korea: Calcum Electronics Pvt. Ltd., 17 Mts., Rs. 3,24,451; Hindustan Copper Ltd., 74,250 kgs., Rs. 9,68,826; From Saudi Arabia: Jaisingh Packaging, 102.900 Mts., Rs. 13,35,976; J. K. Sayani Enterprises, 49.5 Mts., Rs.



9,097; Khetan Packaging Pvt. 17.5 Mts., Rs. 2,84,008; Gur Plastics, 17.150 Mts., Rs. 1,569; Prince Marketing, 450 Mts., Rs. 6,71,328; Re-Plastics, 34.65 Mts., Rs. 5,577; Texplast Engg. Pvt., 33,000 kgs., Rs. 4,32,731; Plast, 24.750 Mts., Rs. 3,22,-; From Singapore: Hari Vish-Packaging Ltd., 49.5 Mts., Rs. 0,871; PVD Plast Mould Inds., 24,750 kgs., Rs. 3,22,942; ta Exim P. Ltd., 99 Mts., Rs. 33,924; From Taiwan: Jagh Prasad Jain, 24,750 kgs., 3,22,942; From USA: Darshit Enterprises, 105 Mts., Rs. 10,-430; From Yugoslavia: Lucky ders, 48 Mts., Rs. 5,14,101; per Suppliers, 131 Mts., Rs. 83,356.

**HDPE INJ. MOULDING GRA-**  
From USA: United Brothers, 5 Mts., Rs. 10,22,430.

**HDPE MOULDING POWDER:**  
From Saudi Arabia: Hindustan Vacuum Glass Ltd., 17.150 kgs., 2,24,889.

**HDPE RESIN:** From Canada: arat Vijay Mills Ltd., 49.5 Mts., 5,93,185; From Korea: Hin- stan Copper Ltd., 1,48,500 s.

**LDPE:** From Brazil: Ansat Plas- es Pvt. Ltd., 150 kgs., Rs. 18,- 526; Indian Petrochemicals prpn. Ltd. 2,550 Mts., Rs. 3,14,- 3,301; From FRG: Industrial les Corpn., 20 Mts., Rs. 2,13,- 4; Milan Inds., 21.5 Mts., Rs. 29,732; Ravindra Plastic Inds., Mts., Rs. 3,20,556; Vipul En- prises, 30 Mts., Rs. 3,20,556; om Qatar: Indian Petrochemi- ls Corpn., 594 Mts., Rs. 86,- 3,363; From Singapore: V. K. Engineering Plastic Inds., 16.5 Mts., Rs. 2,42,073; From UK: arat Petroleum Corpn. Ltd., 17 Mts., Rs. 2,33,958; From Yugos- lvia: Asian Polymers Pvt. Ltd.,

100 Mts., Rs. 10,91,464; Ravi International, 40,000 kgs., Rs. 4,95,200; From Yugoslavia: Ravi International, 40,000 kgs., Rs. 4,95,200.

**LDPE MOULDING POWDER:** From FRG: Milan Industries, 30 Mts., Rs. 3,20,556; Suvin Co- extrusions Pvt. Ltd., 50 Mts., Rs. 5,34,260.

**POLYACETAL MOULDING POWDER:** From Japan: Peico Electronics & Elect. Ltd., 2,000 kgs., Rs. 57,126.

**POLYACRYLIC ACID:** From USA: PDI Chemicals Pvt. Ltd., 2,400 lbs., Rs. 62,320.

**POLYETHYLENE MOULDING POWDER:** From FRG: Albert David Ltd., 15 Mts., Rs. 2,50,- 551.

**POLYPROPYLENE:** From Aus- tralia: Beijaj Plastics Ltd.,

191,875 Mts., Rs. 33,07,483; From Belgium: Kanpur Plastipack Ltd., 139.3 Mts., Rs. 24,65,758; From Czechoslovakia: Associated Plastic Inds., 14 Mts., Rs. 1,62,- 208; From France: Rajasthan Petro Synthetics Ltd., 1,500 kgs., Rs. 3,28,219; Rajasthan Petro synthetics Ltd., 1,500 kgs., Rs. 3,28,219; Arjun Impex, 41.16 Mts., Rs. 2,88,747; From FRG: Gujarat Propack Ltd., 500 kgs., Rs. 30,280; New Plastomers In- dia Ltd., 14 Mts., Rs. 2,40,464; From Italy: Furt Plastic Inds. Ltd., 30 Mts., Rs. 5,21,926; Joshi For- mulabs P. Ltd., 15,000 kgs., Rs. 2,43,436; Mutual Steel Inds., 30 Mts., Rs. 5,21,926; Tepack Inds., 15,000 kgs., Rs. 2,47,131; From Netherlands: Cosmo Films Ltd., 64,000 kgs., Rs. 11,46,479; Gar- ware Wali Ropes Ltd., 1,28,000



In Cotton, Nylon, Acrylic polyester Fibre polypropylene, P.V.A., P.V.C. are manufactured in over 400 Varieties - and also Supplied as per your specifications and require- ments. prices are competitive. Our full-fledged technical department is ready to assist you.

Please contact for further details and sample.

**BHARAT INDUSTRIAL CORPORATION**

TELEX: 011-72262 DRAG IN.

90, BHAJIPALA LANE TAVAWALA, BLDG. BOMBAY 400 003.  
GRAM: "BHARATTUBE", BOMBAY - 400 003.  
PHONE: 341920, 341869, 335759 ■ RESI.: 5134142



kgs., Rs. 21,66,161; From Singapore: Noval Products, 16,000 kgs., Rs. 2,84,593; From UK: Qadri Commercial Corpn., 15,000 kgs., Rs. 2,37,595; From USSR: Patin Bros. Pvt. Ltd., 16 Mts., Rs. 2,83,747; From Yugoslavia: Eagle Flasks Pvt. Ltd., 496 Mts., Rs. 89,54,188.

**POLYPROPYLENE RESIN:** From Bulgaria: Nidhi Plastics P. Ltd., 196.45 Mts., Rs. 34,17,866.

**POLYSTYRENE:** From Korea: A. K. Structural Foam Ltd., 8,000 kgs., Rs. 1,92,152.

**POLYSTYRENE MOULDING POWDER:** From Korea: Dilip Industries, 17 Mts., Rs. 3,11,208.

**POLYSTYRENE:** From Korea: Sargodha Enterprises, 17 Mts., Rs. 3,20,037; From Mexico: Hemant Plastic Inds., 2,000 Mts., Rs. 12,08,640; Seth Plastic Bhandar, 52.5 Mts., Rs. 9,06,-

480; Verma Extrusions Pvt. Ltd., 10 Mts., Rs. 1,43,371.

**PROPYLENE GLYCOL:** From USA: Unit and Industries, 10,105 Mts., Rs. 1,06,269.

**PTFE:** From Japan: Jayems Technical Associates, 1,000 kgs., Rs. 1,13,603.

**PTFE RESIN:** From Australia: Nalin India Ltd., 1,200 kgs., Rs. 1,71,379; From FRG: Garg Associates Pvt. Ltd., 4,000 kgs., Rs. 5,45,296; From Italy: Hindustan Ferrodo Ltd., 780 kgs., Rs. 1,06,333; From Japan: Asheston Packing & Mfg. Co. Pvt. Ltd., 500 kgs., Rs. 64,917; Fluoropolymer Products Inds., 2,300 kgs., Rs. 3,33,734; Sealwell Inds., 550 kgs., Rs. 67,578; From Brazil: Bhagirath Agro Plast P. Ltd., 50 Mts., Rs. 6,46,005; Novilex Plastic Pvt. Ltd., 100 Mts., Rs. 12,-

92,354; Trimurti Foods & Pharma Pvt. Ltd., 50 Mts., Rs. 6,46,000.

**PVC RESIN:** From Korea: H. Leather Cloth Mfg. Co. P. L. 30 Mts., Rs. 4,56,505; Hindustan Copper Ltd., 100 Mts., Rs. 12,92,353; Mohan Overseas Pvt. Ltd., 75 Mts., Rs. 10,36,045; National Leather Cloth Mfg., 100 Mts., Rs. 12,01,558; From Mexico: Ashish Industries 201 Mts., Rs. 27,21,948; Prakash Pipes Inds. Ltd., 100 Mts., Rs. 12,14,460; From Poland: Gwalior Pipes Ltd., 247.5 Mts., Rs. 23,31,26; From Saudi Arabia: M. Vinyals 50 Mts., Rs. 7,50,029; Varsha Agro Plast Pvt. Ltd., 100 Mts., Rs. 13,82,590; From Turkey: Vinyl Products, 200 Mts., Rs. 27,85,571; From Yugoslavia: Accurate Pipes & Plastics Pvt. Ltd., 25 Mts., Rs. 3,30,034; Garware Plastics & Polyester Ltd., 800 Mts., Rs. 1,05,80,197; Marvel Vinyl Pvt. Ltd., 50 Mts., Rs. 6,62,068; Orient Extrusions Pvt. Ltd., 175 Mts., Rs. 23,12,824; Polycab Inds., 200 Mts., Rs. 3,31,034.

**PVC RESIN SUSPENSION GRADE:** From France: India Plastic Bhandar, 44.87 Mts., Rs. 5,70,337; From Japan: Godhawi Brothers India Pvt. Ltd., 200 Mts., Rs. 3,53,466; From Korea: The Bhor Inds. Ltd., 200 Mts., Rs. 28,17,344; Jain Tube Co. Ltd., 100 Mts., Rs. 13,05,084; From Taiwan: P. Hira, 25 Mts., Rs. 3,53,466; From Turkey: Gwalior Polypipes Ltd., 749.625 Mts., Rs. 18,48,872; Premier Vinyl Flooring Ltd., 75,375 Mts., Rs. 9,34,009; Uniplast India Ltd., 100.125 Mts., Rs. 12,46,325; From USA: American Embassy 25 Mts., Rs. 3,53,466; From Yugoslavia: Oriental Extrusion Pvt. Ltd., 100 Mts., Rs. 11,71,474; Selfshine Industries, 100 Mts., Rs. 14,39,371.

AVAILABLE IN READY STOCK

## SULFAMIC ACID

SULFAMIC DESCALANT GP & SR GRADE

## CATALYST LCP

Mfg. by :

**M/s. The Dharamsi Morarji Chemical Co. Ltd.**

Also Available From Ready Stock:

**GLAUBER'S SALT — TRI SODIUM PHOSPHATE SODIUM SULPHIDE FLAKES, POTASSIUM PERMANGANATE, SODIUM META SILICATE, SULPHURIC ACID — 98 & 70, POLYETHYLENE WAX, RESORCINOL, SODIUM SILICO FLUORIDE & OTHER TEXTILE CHEMICALS.**

## M. D. VORA & CO.

Stockists For :

**M/s. DHARAMSI MORARJI CHEMICAL CO. LTD.**  
Amrit Niwas, 165/2, Lohar Chawl, Bombay-400 002.

Phones : 317023/251737



FOR YOUR REGULAR REQUIREMENTS OF :

# BUTYL ACETATE OCTYL ACETATE DI OCTYL MALEATE

Please Contact Manufacturers :

## VIKRAM CHEMICAL INDUSTRIES

1218, Dalamal Tower, Plot No. 211, Nariman Point, Bombay-400 021.

Phones : 230006, 231192, 233554, 233562.

# IRON POWDER

(REDUCTION GRADE)

## THACKER PULVERIZING CO.

11, Amar Jyot, Dr. R. P. Road, Bombay - 400 080.

Phone : 560 07 84/561 78 12.

For Your Regular Requirements Of :

Acetonitrile  
Acetyl Chloride  
Acrylamide  
Acrylonitrile  
Cyclohexane  
Di Methyl Formamide  
Di Methyl Sulphoxide  
Epichloro Hydrine  
Ethylene Dichloride  
Formic Acid — 99% & 85%  
Hydroxylamine Hydrochloride  
Chloroform

Iso Amyl Alcohol  
Isobutyl Alcohol  
Iso Propyl Alcohol  
Lithium Hydroxide  
Magnesium Oxide  
Malonic Acid  
Methyl Cellulose 4000  
Methyl Formate  
Morpholine  
Methyl Ethyl Ketone  
N. Butyric Acid  
H. Heptane

Quinoline  
P.C.B.A.  
Paraformaldehyde 84-85%  
Perchloro Ethylene  
Petroleum Ether 40-60%  
Sodium Methoxide  
Thiourea  
Tri-Chloro Ethylene Glycol  
Tertiary Butyl Alcohol  
Zinc Dust

## RAJENDRA & COMPANY

Gopal House (2nd Floor), 7/9, Kumbharwada Cross Lane,  
Veer Vithaldas Chandan Street, BOMBAY-400 003.

Phone: 321020/339968/344937

Residence: 6124644/6122149



For Your Requirements Of :

# MONO ETHYLENE GLYOL

AND

- |  |   |
|--|---|
| 1. Acetic Acid   | 8. Neo Zapon Dyes — Yellow & Orange                                     |
| 2. Behenyl Alcohol   | 9. Ethyl Acrylate   |
| 3. Glauber's Salt  | 10. Para Chloro Benzene Sulphonamide Acid                               |
| 4. Hydrazine Hydrate   | 11. Soisperse — ICI, U.K. make<br>Dispersant for Paint and Printing Ink |
| 5. Lithophone  | 12. Di Chloro Diphenyl Sulphone   |
| 6. N. Heptane  | 13. Desmorapid Catalyst for Foam Industry                               |
| 7. Permanent Yellow GRL-80 Hoechst<br>German make for Printing Ink | 14. Ion Exchange Resins   |
|  | 15. Water Treatment Plants & Chemicals.                                 |

Please Contact :

## M/S. DOSHI & COMPANY

7, Premjivan, 87, Kazi Sayed Street,  
Khand Bazar, Bombay-400 003.

Phone: 343480 Resi. : 455147,462564

Gram: DHRIECHEM

Ahmedabad Phone: 877156; Resi. : 407909

## ANISIC ALDEHYDE ★ ANISIC ALCOHOL CYCLOHEXANONE ★ TARTARIC ACID

Toluene  
Benzene  
Xylene  
E.P. 60-80/40-60  
Trichloroethylene  
DBP/DOP

Methylene Chloride  
MMA Monomer  
N-Butanol  
M.I.B.K.  
I.P.A./M.E.K.  
Butyl & Ethyl Acetate

C.T.C./E.D.C.  
Chloroform  
N. Hexene  
Methanol (Tech./Pure)  
Acetone (Tech./Pure)  
Formaldehyde

Please Contact :

## Ajmera Chemicals

Phone : 325758/332325, Resi.: 696948

276/78, Samuel Street, 3rd, Floor R. No. 21, Bombay-400 003.

**Ammonium Bromide**  
**Potassium Carbonate**  
**Zinc Dust** 98%  
**Zinc Oxide**

96% & 98%

Rubber Grade — White Seal — I.P. Grade

**M VORA CHEMI TRADE**

265, Samuel Street, Bombay-400 003.

Phones : 333762/63/64/325265/345377